## Management of Intraoperative Free Flap Arterial Thrombosis with Argatroban in the Heparin-Allergic Patient

***Sir:***

The use of systemic heparin is a mainstay in the management of intraoperative anastomotic thrombosis during free tissue transfer. In patients with a heparin allergy or previous diagnosis of heparin-induced thrombocytopenia, viable alternatives to heparin do exist; however, their role in the treatment of anastomotic thrombosis in microsurgery has yet to be defined.

We present a case in which repeated intraoperative arterial thrombosis in free flap breast reconstruction was successfully managed following initiation of a continuous intravenous Argatroban infusion. Bilateral muscle-sparing free transverse rectus abdominis musculocutaneous flaps were elevated in a 46-year-old, otherwise healthy, nonirradiated woman with a history of right breast cancer. During inset, the left flap was noted to have minimal dermal bleeding. Arterial thrombosis was found in a 1- to 2-cm segment at the anastomosis. Following subsequent revisions, arterial thrombosis occurred twice more at 8 and 10 minutes following complete resection of the thrombotic segment and successful reanastomosis. Given a documented allergy to heparin products, midrange anticoagulation was initiated with Argatroban (GlaxoSmithKline, Brentford, England). Approximately 40 minutes after administration, a fourth arterial anastomosis was performed. This remained patent and resulted in a successful reconstruction.

Argatroban is a synthetic direct thrombin inhibitor that has become standard treatment for heparin-inducted thrombocytopenia.[1] Full anticoagulation is achieved by means of a dosage of 2 μg/kg/minute with subsequent titration for a goal partial thromboplastin time of one and one-half to three times the patient's baseline. In the presence of hypercoagulability, goal partial thromboplastin time is generally two to three times the upper limit of normal (partial thromboplastin time, 50 to 90 seconds). Steady-state blood levels are achieved approximately 1 hour after initiation.[2]

It is our practice to manage intraoperative thrombosis requiring anastomotic revision with a mid-range heparin drip. Low- to mid-range anticoagulation may theoretically provide a systemic anticoagulant effect with a decreased risk of bleeding and hematoma compared with full therapeutic range anticoagulation. A similar approach was taken in this case. An initial infusion at full anticoagulation weight-based dosing was given for approximately 30 minutes to achieve a steady state level more rapidly. The reanastomosis was then performed and the dose was then decreased to half. Dosing was then titrated postoperatively to a goal partial thromboplastin time of 36 to 50 seconds (normal range, 23 to 36 seconds). This was continued for 72 hours postoperatively, at which point the patient was transitioned to a prophylactic dose of fondaparinux, 2.5 mg administered subcutaneously (Arixtra; GlaxoSmithKline).

The use of Argatroban for flap salvage in the setting of postoperative heparin-inducted thrombocytopenia has been reported previously.[3] To our knowledge, this is the first report of intraoperative Argatroban in the setting of recurrent arterial thrombosis. Although the impetus for thrombosis in this case is unclear and may have been technical, we felt the systemic anticoagulation was ultimately the key to success given the temporal relationship between maintenance of a patent anastomosis and administration of Argatroban. Anticoagulation in free tissue transfer is often highly debated and based on surgeon preference.[4,5] With an ever-broadening variety of anticoagulant agents available today, the microsurgeon should be aware of the options and alternatives, particularly in the setting of allergies and/or heparin-induced thrombocytopenia.

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### DISCLOSURE

*The authors have no financial interest in any of the products, devices, or drugs mentioned in this article.*

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