Heparin administration prior to endoscopic vein harvest limits clot retention and improves graft patency

Poston R, Desai P

Boston University, Boston, Massachusetts, USA

Objective: Residual clot strands within the saphenous vein (SV) is an increasingly recognized sequela of endoscopic vein harvest (EVH). CO_2 insufflation, used to facilitate visualization, causes stagnation of blood within the SV yet anticoagulation is not usually given until after harvest. We hypothesized that heparinization prior to CO_2 insufflation would reduce the severity of this residual clot and improve graft patency.

Methods: We prospectively studied acute graft patency in 460 patients that underwent OPCAB using IMA and SV procured endoscopically using CT angiography on POD 5. Patients receiving no heparin prior to EVH (n = 306) were compared to those receiving a heparin bolus of 2500U (n = 55), 5000U (n = 60), or 200U/kg (n = 31) prior to the onset of EVH. In a subset of the most recent 110 patients, the full tract of harvested SV was imaged using catheter-based infrared imaging (OCT) in order to measure residual clot within the conduit, quantified as clot volume (mm^3) and %SV length that contained clot (%clot). Baseline and intraoperative characteristics were compared between the groups receiving heparin versus no heparin.

Results: Graft patency was significantly greater in those patients that received any heparin bolus (n = 146) versus no heparin (n = 306) prior to EVH (98.9 versus 95.2% patency, $p < 0.05$). Compared to no heparin control group that underwent OCT imaging, those receiving heparin prior to EVH showed significantly reduced the incidence (85 versus 42%, $p < 0.05$) and volume of clot (1.2 ± 1.3 versus 0.18 ± 0.37 mm^3, $p < 0.05$) and %clot (72 ± 39 versus 19 ± 18 %, $p < 0.001$). All analyzed perioperative risk factors were similar between the pre-heparinized and control groups.

Conclusion: Giving a heparin bolus as low as 2500U prior to EVH was found to be associated with a reduced quantity of retained clot and improved SV graft patency compared to SV procured without preheparinization. The inconsistent use of this strategy in centers participating in the PREVENT IV trial may help explain the disappointing SV graft patency rates seen in conduits procured using EVH.

Paper presented at the 2009 annual meeting of the International Society of Minimally Invasive Cardiothoracic Surgery; June 3–6, 2009; San Francisco, CA.