

Haemodynamic Effect of Intermittent Pneumatic Compression of the Leg After Infainguinal Arterial Bypass Grafting

Delis, K.; Husmann, M.; Szendro, G.; Peter, N.; Wolfe, J.H.; Mansfield, A.O.

Regional Vascular Center, Surgery and Department of Academic Cardiology, St. Mary's Hospital, Imperial College School of Medicine, London, UK

Background: Intermittent pneumatic compression (IPC) may increase blood flow through infrainguinal arterial grafts, and has potential clinical application as blood flow velocity attenuation often precedes graft failure. The present study examined the immediate effects of IPC applied to the foot (IPC_{foot}), the calf (IPC_{calf}) and to both simultaneously ($IPC_{\text{foot+calf}}$) on the haemodynamics of infrainguinal bypass grafts.

Methods: Eighteen femoropopliteal and 18 femorodistal autologous vein grafts were studied; all had a resting ankle: brachial pressure index of 0.9 or more. Clinical examination, graft surveillance and measurement of graft haemodynamics were conducted at rest and within 5 s of IPC in each mode using duplex imaging. Outcome measures included peak systolic (PSV), mean (mV) and end diastolic (EDV) velocities, pulsating index (PI) and volume flow in the graft.

Results: All IPC modes significantly enhanced mV, PSV, EDV, and volume flow in both graft types, $IPC_{\text{foot+calf}}$ was the most effective. $IPC_{\text{foot+calf}}$ enhanced median volume flow, mV, and PSV in femoropopliteal grafts by 182, 236 and 149 percent respectively, and attenuated PI by 60 percent. Enhancement in femorodistal grafts was 273, 179 and 53 percent respectively, and PI attenuation was 63 percent.

Conclusion: IPC was effective in improving infrainguinal graft flow velocity, probably by reducing peripheral resistance. IPC has the potential to reduce the risk of bypass graft thrombosis.

Presented at the inaugural meeting of the Society of Academic and Research Surgery, London, UK, January 2002.