

Measuring Intraoperative Transit-Time Flow: Arterial, Venous and Sequential Grafts, and New Research Areas



Keywords

Flowmeter • Internal mammary artery • Venous graft • Sequential graft

To the Editor,

With great interest, I read the article by Hashim and associates [1] and congratulate them for suggesting an effective, simple and reproducible method of detecting technical errors in an internal mammary artery anastomosis during aortic cross-clamping. This method can be used routinely, and not just when a surgeon suspects technical imperfections. Flowmeter utility is not restricted to arterial anastomosis. After a distal saphenous anastomosis, the cardioplegic line may be connected to the proximal end of the graft, and flow measured during cardioplegia delivery. Furthermore, when the proximal anastomosis is created soon after the distal one—delivered in the aortic root and through the attached graft—the patency of both the proximal and distal anastomosis may be evaluated.

Flowmeters have also clarified the differences between sequential and separate grafts. The proximal trunk of a sequential graft has greater flow than two separate grafts [2]. On the other hand, the sum of two separate grafts increases flow/minute to levels above those measured in a sequential graft [3]. In other words, even if the flow measurement is higher in the proximal trunk of a sequential graft, due to the double distal vascular bed, the total amount of blood reaching the heart is less than with two separate grafts.

Finally, the internal mammary arteries have been studied for their potential for developing collaterals in ischaemic conditions, and are considered the main source of extracardiac artery flow to the heart, through their pericardiophrenic branch. This is a novel research field for refractory angina [4–6]. One can speculate that flowmeter techniques, if accomplished with micro-probes, could be useful for measuring flow in the pericardiophrenic branch. Though the technique of coronary artery

bypass anastomosis has not evolved substantially over the past few decades [7], flowmeter techniques open the door to both the practical and complementary evolution of coronary surgery, and could hopefully be applied even to newly-developing research areas.

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