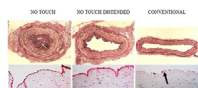


The authors reported no conflicts of interest.

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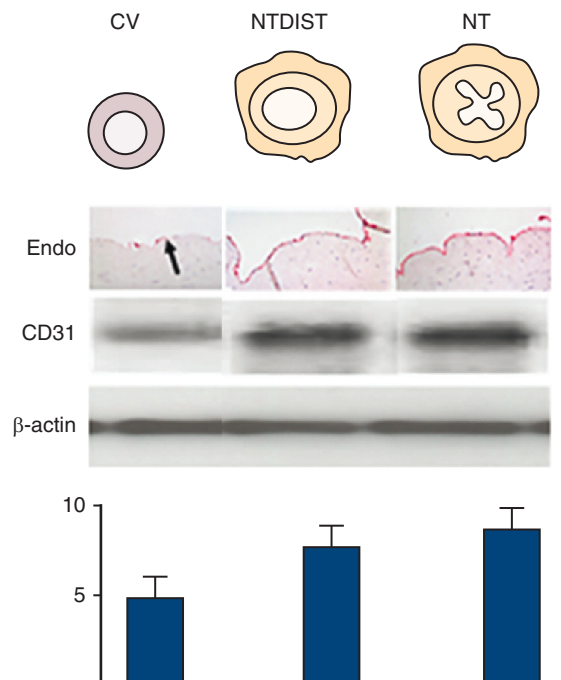
### IMPACT OF SAPHENOUS VEIN HARVESTING ON

### GRAFT DIAMETER: SUPPORTING THE NO-TOUCH TECHNIQUE

#### To the Editor:

In a recent study published in the *Journal*, Kurazumi and colleagues<sup>1</sup> compare the effect of conventional (CV) versus no-touch (NT) saphenous vein (SV) harvesting on graft diameter pre- and postimplantation. Here, ultrasound imaging and electrocardiogram-gated enhanced computed tomography showed that preoperative versus postoperative SV graft diameter was significantly distended in the CV group ( $P < .0001$ ) but not changed in the NT group ( $P = .33$ ). Also, the diameter mismatch was significantly smaller in the NT versus the CV group ( $P < .0001$ ). It was concluded that the NT technique avoids the expansion of graft diameter and diameter mismatch between the SV grafts and the coronary artery. A number of factors are proposed to explain the differences between CV and NT SV grafts. These include the effects of manual pressure and distension in CV SV at harvesting, damage to various structures in CV, and their preservation in NT SV grafts, including the endothelium, vasa vasorum, and perivascular adipose tissue (PVAT) (Figure 1). We believe that the PVAT surrounding NT SV plays a crucial role in the improved patency of NT grafts, a patency that is superior to CV grafts and comparable with the internal thoracic artery at up to 16 years.<sup>2</sup> The surrounding cushion that remains intact on NT grafts is not only a source of nitric oxide<sup>3</sup> and other factors beneficial to graft performance<sup>4</sup> but also provides mechanical support, protecting the SV from increased arterial pressure, shear, and turbulence. It also prevents grafts of excessive length from kinking.<sup>5</sup>

In their Discussion, Kurazumi and colleagues cite their previous study, which showed no difference in endothelial integrity between the CV and NT groups. However, in this study, SV in the CV group was distended “by moderately high pressure,” whereas 300-mm Hg pressure has routinely been used by our group, a pressure that causes considerable



**FIGURE 1.** Conventional versus (CV) no-touch saphenous vein (NT): effect of distension. *Top*, Diagrammatic representation of CV that has PVAT removed, adventitia damaged, and has been distended at 300 mm Hg for 1 minute; NT SV with PVAT and adventitia intact that has been distended at 300 mm Hg for 1 minute (NTDIST); and NT SV with PVAT and adventitia intact and not distended. *Endo*, Endothelium identified by immunohistochemistry (red CD31 immunostaining) where luminal endothelium of SV is damaged but NTDIST and NT endothelium is virtually intact. *Arrow* indicates intact endothelial cells surrounded by areas of endothelial denudation. *CD31*, Western blots showing CD31 protein expression where CV is lower than NTDIST and NT. *β-actin*, Protein control. *Bottom*, Densitometric analysis of 8 western blots: mean ± standard deviation arbitrary units from  $n = 3$  SV of all preparations Modified from Dashwood and colleagues<sup>3</sup> and Samano and colleagues.<sup>5</sup>

endothelial damage.<sup>5</sup> The endothelium of NT SV grafts remains intact, as no high-pressure distension is required at harvesting. Also, since the surrounding cushion of PVAT protects the endothelium of NT grafts against 300-mm Hg distension, it is likely to protect the endothelium of these grafts against the effect of coronary arterial pressure of ~100 mm Hg.<sup>5</sup> The effect of PVAT on NT SVs therefore plays an important role in the improved patency of these grafts via both endothelial- and PVAT-derived nitric oxide as well as other factors.<sup>4</sup> Interestingly, the authors mention the role of PVAT as an external support of the NT SV graft. This is an area of research that has attracted considerable attention recently, where CV SV graft improvement has been studied using a number of strategies ranging from external mesh and fibrin glue to Dacron and metal external stents.<sup>5</sup> This study by Kurazumi and colleagues reinforces the advantages of NT SV harvesting and questions why any form of artificial support to damaged CV SV grafts is needed when NT SV grafts possess their own natural

external support, the surrounding cushion of perivascular fat?

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