

## **Expandable External Support Device to Improve Saphenous Vein Grafts Patency After CABG**

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**Objective:** Low patency rate of saphenous vein grafts (SVG) remains a major predicament in surgical myocardial revascularization. We developed a novel expandable external support system to mitigate causative factors for early and late vein grafts failure.

**Methods:** For the preclinical study fourteen adult sheep underwent off pump revascularization using two vein grafts for each; one to the LAD and the other to the largest obtuse marginal. One graft was supported with the device while the other served as a control. The target vessel was alternated in every case. The animals underwent immediate and late (12 weeks) angiography and then were sacrificed for histopathologic evaluation.

**Results:** There were three perioperative deaths that were unrelated to the device implanted and all animals but one survived the follow-up period. Among the surviving animals, three grafts were thrombosed and one was totally occluded, all in the control group ( $p= 0.043$ ). In quantitative angiographic evaluation, there was no difference between groups in the immediate postoperative level of grafts uniformity (coefficient of variance (CV) of control grafts was 7.39 vs. 5.07 in the supported grafts,  $p=0.082$ ). At 12 weeks, there was a significant non uniformity in the control grafts versus the supported grafts (CV = 22.12 vs. 3.01,  $p<0.002$  respectively).

Moreover, in histopathologic evaluation the mean neointimal area of the control grafts was significantly larger than in the supported grafts (23.1mm<sup>2</sup> vs. 11.1mm<sup>2</sup>  $p<0.02$ , respectively). There was no difference in the level of inflammation or intimal injury between groups.

**Conclusion:** The expandable SVG external support system was found to be safe and efficacious in reducing SVG's non uniform dilatation and neointimal formation in animal model early after CABG. This novel technology may have the potential to improve SVG patency rates after surgical myocardial revascularization.