306b Strength Enhancement for Arterial-Implantable Fibrin Based Tev

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TEVs using fibrin, a biocompatible natural biomaterial, as scaffold, have a lot of advantages: controllable degradation, fast remodeling of extracellular matrix, comparable vasoreactivity with the treatment of some growth factors, such as TGF-b1 and insulin. Our group has already successfully transplanted fibrin based TEV to ovine jugular veins and these TEVs were patent 15 weeks after transplantation. But these TEVs were not strong enough to withstand the high pressure in arteries. Here we report a method that significantly improves the strength of TEV: a two-layer TEV was made, the inner layer was made of a low concentration (2.5mg/ml) of fibrinogen entrapped with smooth muscle cells; the outer layer was made of very high concentration of fibrinogen (30mg/ml) without cells. The first layer was cultured to achieve a maximum degradation, and then, an optimal time point was selected to add the second layer to prevent the separation of the two layers. Aprotinin (20*f*Ýg/ml) was added to culture media at this time to prevent further fibrinolysis. We found that the break force of TEVs after 2 weeks culture was several times higher than single layer TEVs. This result may provide a possible solution for artery implantation.