

Tissue-Engineered Blood Vessel for Adult Arterial Revascularization

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With the rise in obesity and heart disease in the United States and around the world, there is a strong correlation with the need to develop various ways to repair damaged blood vessels. Previous treatments of the repair of blood vessels involved stents and also various forms of synthetic sheaths. However, these treatments had their problems. Problems included movement of the stent, blood clotting, overall failure of the sheath, and rejection by the subject's body.

A new development in the world of arterial revascularization is the use of autologous cells and sheet based engineering to develop a completely natural autologous tissue engineered blood vessels. One of the promising aspects of these blood vessels is that they contain no synthetic or exogenous materials.

These blood vessels are made by extracting fibroblasts and endothelial cells through a skin and superficial vein biopsy. From there they are harvested and grown into tissue where they are viable for surgery.

Ten patients were involved in a study to show the effects of these autologous blood vessels. All of the patients had arteriovenous shunts that were falling out. They also had gone through surgery where shunts were placed in and failed. The autologous blood vessels were

surgically implanted and tests were performed on them. The main test was to show the strength of the vessels. Tests proved that these engineered vessels show the same characteristics as normal blood vessels. They share the same strength characteristics.

However these vessels had their problems. Where half of the subjects increased flow rates through the valves, the remaining patients developed complications. The problems mentioned were thrombogenic failure, slow flow rate, and degeneration of the vessel. Where some of the complications may seem like a major flaw, the scientists involved in this study believe that these tissue engineered vessels are a milestone and will be used more frequently as studies continued.

Works Cited

- "Tis Engineered Blood Vessel for Adult Arterial Revascularization." *New England Journal of Medicine* 1453rd ser. 357.1451 (2007). Web. <<http://http://content.nejm.org/cgi/content/full/357/14/1451>>.
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