

P89. Investigation For The Strength Of Glutaraldehyde Treated Human Pericardium, The Materials For Aortic Valve Reconstruction

Hiromasa Yamashita¹; Kiyotaka Iwasaki²; Shigeyuki Ozaki¹; Shin Uchida¹; Takayoshi Matsuyama¹; Mitsuo Umezu²

¹Toho University Ohashi Medical Center Department of Cardiovascular Surgery, Tokyo, Japan; ²Waseda University, Tokyo, Japan

OBJECTIVES: We performed aortic valve reconstruction using autologous glutaraldehyde treated pericardium since April 2007. However, the strength of human pericardium has not been unclear. We compared glutaraldehyde treated human pericardium with aortic valve leaflet from a point of strength.

METHODS: We gathered glutaraldehyde treated human pericardiums, noncalcificated aortic leaflets, calcificated aortic leaflets and decalcificated aortic leaflets. We measured ultimate strength and elasticity examining pull examination about each materials. Decalcification of aortic valve was made by using CUSA. Human pericardium is treated in a bowl of 0.6% buffered glutaraldehyde for 10 minutes.

RESULTS: We examined 8 glutaraldehyde treated human pericardiums, 12 noncalcificated aortic leaflets, 9 calcificated aortic leaflets, and 21 decalcificated aortic leaflets. Ultimate strength of glutaraldehyde treated human pericardium was 10MPa. Leaflets ultimate strength was 2.8MPa in noncalcificated leaflets, 1.0MPa in calcificated leaflets, 0.8MPa in decalcificated leaflets.

CONCLUSIONS: This study shows two interesting facts. Firstly, glutaraldehyde treated human pericardium is 4 times as strong as that of noncalcificated leaflets. This fact shows that glutaraldehyde treated human pericardium has satisfactory strength for aortic valve reconstruction materials. Secondly, Calcified leaflets has little stronger than decalcified leaflets. CUSA can remove calcification without reducing the strength of materials.

strength of materials

