

Mitral allograft has never been as widely used as the aortic one for the treatment of infective endocarditis in clinical practice. Results of mitral valve replacements with mitral allograft were poor. Development of better techniques of mitral valve repair and improving quality of valve prostheses led surgeons to abandon use of mitral allografts in mitral position. On the other hand that technique could be helpful for treatment of tricuspid valve pathology, mainly of infectious endocarditis.

We were evaluating the possibility of inserting a cryopreserved mitral allograft into the tricuspid position in a sheep experimental model. Within the framework of this experimental project the mechanical properties of the cryopreserved mitral allograft were tested.

A novel methodology of graft tissue mechanical properties testing was developed. It reflexes the surgical technique of mitral allograft transplantation as it investigates whole functional unit composed of mitral annulus, leaflet, chordae tendinaea, and papillary muscle together. A five-parameter Maxwell model was applied to characterize the viscoelastic behavior of sheep mitral valves.

A control group of 39 fresh mitral specimens and a test group of 13 cryopreserved mitral allografts processed according to the tissue bank standards were tested. The testing protocol consisted of six loading cycles with 1 mm elongation every 5 min.

No significant difference in the mean values of the determined parameters ( $p > 0.05$ ) has been proved. It confirms the main hypothesis that cryopreservation does not significantly influence material parameters characterizing the mitral allograft tissue mechanics.