

SUMMARY

The development of vascular replacement for low flow rates is a topical issue. The model for developing the development of replacement properties, which are based on the idea of assuming the characteristics of the biological model - vena saphena and programming these properties into a model of constructed replacement is one of the possible directions of development. The presented replacement, which is the result of the work of the author's team, consists of three parts - a non-absorbable scaffold representing the media, and two absorbable collagen layers - pseudointima and pseudoadventice. Target parameters of the prosthesis were determined by test results of the basic physical testing method - uniaxial tensile test and inflation-extension test, as well as other procedures in human saphenous specimens. The key issue is the technology of producing the collagen layer of the prosthesis. However, other manufacturing processes can also have a significant impact on vascular prosthesis properties, such as collagen hardening, antithrombogenic treatment of the inner surface of the vascular replacement, and the use of a sterilization method.

Furthermore, the author deals with the development of a new female component of the three-layer vascular prosthesis of the Czech carp, which is characterized by lower antigenicity compared to bovine collagen. It compares standard and purified carp collagen, which has a lower residual fat ratio with the question of comparing patency in experimental implantation in two groups on a sheep model.

A total of 14 prostheses in group A were implanted in seven sheep (standard carp collagen) and 18 prostheses in group B in nine sheep (purified carp collagen). For each sheep, the right-hand restoration was artificially narrowed to demonstrate patency of the prosthesis in the low-flow bed. Group A flow of prostheses decreased from original 297 ± 118 ml / min to 158 ± 159 ml / min ($p = 0.041$) after application of artificial stenosis, as well as from 330 ± 164 ml / min to 97 ± 29 ml / min ($p = 0.0052$) in group B ($p = 0.27$ between the two groups). In group A, two vascular prostheses were occluded at five and three days after implantation in five sheep. In Group B, out of six surviving sheep, only one prosthesis on the left neck remained open ($p = 0.0017$). Histology of explanted exposures showed intimal layer degradation at the endothelial endothelial endpoint (anastomosis) in group A and the formation of a strong fibrous intimal layer in group B. it plays a crucial role in the patency and the formation of structural changes after implantation in the sheep model.

KEY WORDS: Collagen based vascular graft, low-flow graft, inflation-extension text, crosslinking, composite tube, sheep, artificial blood vessel