

THE TECHNOLOGY FOR DEVELOPING AND OBTAINING THE NEXT GENERATION OF VASCULAR STENTS THROUGH MICROINJECTION

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Introduction

Cardiovascular diseases (CVD) are currently one of the most important problems in medicine. According to the World Health Organization, diseases of the cardiovascular system are the greatest cause of death for people all over the world. WHO estimated 17.9 million people died from CVDs in 2019, accounting for 32% of all deaths worldwide [1]. Low-invasive procedures, including coronary angioplasty, are among the most promising and effective methods of preventing the effects of coronary heart disease and cardiovascular diseases. Bioresorbable vascular stents (BRS) pose an interesting alternative for metal vascular stent, because they provide mechanical support and are not burdened with typical disadvantages resulting from the use of metal stents, such as vascular inflammation and thrombosis [2,3]. Despite processing difficulties, bioresorbable polymer materials are the subject of intensive scientific research and found wide application in medicine and pharmacy due to their unique properties [4].

The aim of the research is to develop technology for the production of a new generation of biodegradable vascular stents by micro injection techniques and optimize their implantation process.

Materials and Methods

The stent manufacturing process consists of the following steps:

- Synthesis of the material,
- Modeling,
- Material processing,
- Laboratory tests,
- In vivo studies.

Results and Discussion

The obtained vascular stents are shown in FIGs. 1-4.

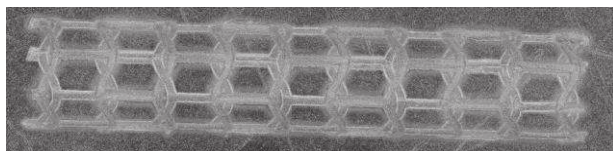


FIG. 1. Vascular stent.



FIG. 2. Vascular stent surface.

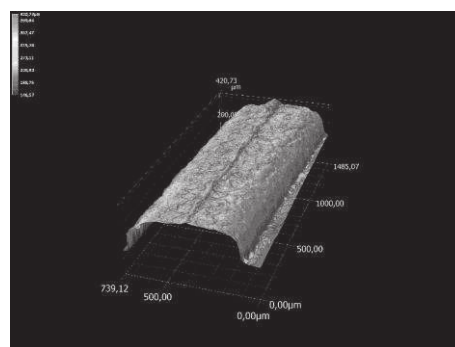


FIG. 3. Vascular stent surface.

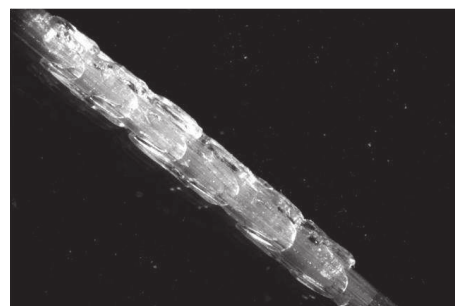


FIG. 4. Vascular stent clamped on the catheter.

Conclusions

The micro-injected stent clamped on the catheter and implanted according to the same procedure as for the implantation of commercially available stents, retains the shape memory effect that allows the stent to fit optimally to the vessel wall.

Acknowledgments

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References

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