

Summary

The concept of bioresorbable scaffolds (BVS) originated in the 90s of the 20th century, however, the first commercially available coronary BVS was Absorb BVS in 2011. The dissertation deals with aspects of working with this type of BVS and its use in real practice. We focused on examining the inflammatory response after implantation of Absorb BVS in comparison with the proven 2nd generation metallic drug eluting stent (DES).

The introduction systematically discusses the topic of BVS from history, through the composition of BVS and implantation techniques to available literature data. The second topic discussed is the inflammatory response after coronary stent implantation, we provide an overview of available data from studies and the introduction of inflammatory markers, which were analyzed in the main study.

The presented work includes three main studies. A **Pilot study** in which we evaluated the systemic inflammatory response to coronary artery trauma caused by percutaneous coronary intervention previously described in the literature. We verified that the selected laboratory-determined markers of systemic inflammation (hs-CRP, IL-6 and serum amyloid A) increase significantly 24/48 hours after PCI compared to basal.

This pilot study was directly followed by the **Randomized study**, in which we randomly implanted two different types of stents in patients with stable coronary artery disease – a 2nd generation metallic DES and an Absorb BVS. Our data showed that although the inflammatory response assessed by the concentrations of selected inflammatory markers after implantation is significant, it does not differ between the two types of stents studied.

At the same time, we performed an **Observational study** that retrospectively evaluated clinical outcomes in a cohort of consecutive patients with Absorb BVS. In this study, we observed a high incidence of BVS thrombosis, which was consistent with data from the first registries and was subsequently confirmed in randomized trials and meta-analyses. Based on these data, the clinical use of the Absorb BVS system was discontinued.

Patient safety as a primary consideration is therefore clearly in favor of proven metallic drug stent technology and the question is whether BVS systems based on other materials and technologies or innovations and improvements in the Absorb BVS concept will bring convincing benefits to patients in the coming years.