

# Summary

Peripheral arterial disease (PAD) of the lower limbs affects more than a fifth of the population over the age of 65 in the developed countries. PAD decreases the quality of life. It can lead to the loss of the limb or even death. Various risk factors that overlap with the risk factors for CHD and CMP have been identified. Chronic forms of PAD are staged according to Fontain's classification. Diagnosis of PAD is based on the clinical presentation, physical examination (including measurement of blood pressure difference) and confirmed by imaging methods. Treatment of PAD consists of influencing risk factors, treating symptoms and revascularization.

Femoropopliteal bypass is the most common surgical procedure performed for revascularization. The conduit can be either a vein or a prosthesis. The preferred connection to the popliteal artery is an end-to-side anastomosis. It carries the risk of occlusion due to thrombosis, intimal hyperplasia, or progression of atherosclerosis. Intimal hyperplasia is a physiological response of the vessel wall to abnormal blood flow - turbulent flow, stagnation, oscillating flow, recirculation. The development of intimal hyperplasia can be influenced by constructing the anastomosis with regard to its hemodynamics - mainly the angle of the anastomosis, the ratio of the diameters between the conduit and the target artery; the use of venous collars is questionable. In addition to intimal hyperplasia, the adaptation of smooth muscle cells in the vessel wall, which precedes its structural changes, is also responsible for the remodeling of the vessel wall.

In our work, we have shown that the anastomosis of the proximal femoropopliteal bypass undergoes remodeling probably soon after its formation. The original course of the popliteal artery is shifted so that it approaches the bypass at the site of the anastomosis. This also straightens the flow from the bypass to the outflow segment of the popliteal artery.

In the second work we compared the clinical characteristics of distal femoropopliteal bypass between patients where the bypass was created on the medial side of the knee and where it was embedded between the condyles. We showed that intercondylar course is associated with better primary, assisted and secondary patency, while the difference in limb preservation is not significant. We believe that the medial course of the bypass leads to the connection of the distal anastomosis at a greater angle, which is one of the factors that affect the onset and progression of intimal hyperplasia.