We read with great interest the study by Morota and Takamoto [1] who report the circulating performance of a sandwich structure vascular graft (Triplex) for aortic replacement. The middle layer of the graft is made of an elastomer non-porous matrix, and the inner and outer layers are made of porous polyester fibres. The grafts were expected to reduce inflammatory reaction, unlike biodegradable materials.

We noticed mild inflammation for Triplex grafts, but severe inflammation for collagen-coated vascular grafts at 4-week implantation. In our previous study, severe inflammatory cell infiltration was found for the acellular bovine jugular vein conduits to reconstruct the right ventricular outflow tract (RVOT) at 1-month implantation [2].

Factually, for the in vivo study of natural and biodegradable synthetic materials, one month is a very important time point for inflammatory reaction and foreign-body reaction. However, inflammation cell infiltration (especially macrophage) for biomaterials leads not only to proinflammatory but also to immunomodulatory and tissue remodelling [3]. The different results are due to different materials and treatments. In this study, the luminal layer components of Triplex grafts were neither natural materials nor biodegradable synthetic materials. Inflammatory cell infiltration for Triplex grafts resulted in inflammatory reaction but not tissue remodelling. Permanent inflammatory reaction would stimulate the intimal hyperplasia, which was partly responsible for pseudointima 4 and 26 weeks after implantation.

Moreover, the luminal surface of the Triplex graft directly contacts with blood. Absence of endothelium on the surface of vascular grafts may promote thrombosis and intimal hyperplasia on the unprotected matrix surface [4]. Endothelialization or a thromboresistant surface for a vascular graft can effectively prevent thrombosis. Pre-coating the luminal surface with heparin or other growth factors before implantation in order to improve endothelialization, or implanting endothelial cells on the luminal surface could be two potential alternatives [5].

Conflict of interest: none declared.

References