Abstract:
In pancreas transplantation (PTx), ischemia/reperfusion-induced deterioration of graft-microcirculation is accompanied by alterations of intermittent capillary perfusion (IP; alternating cessation and resumption of capillary blood flow) is known to counteract malperfusion. Incidence and effectiveness of IP following short-versus long-term preservation of pancreas grafts with University of Wisconsin (UW) solution has not been examined so far. PTx was performed in Lewis rats following 2-h or 18-h preservation in UW solution. Using intravital fluorescence microscopy, functional capillary density (FCD), red blood cell (RBC) velocity, IP-incidence and -frequency were analyzed. Laser Doppler flowmetry allowed for the determination of erythrocyte flux and velocity. Measurements were performed at 30, 60 and 120 min after reperfusion. Nontransplanted animals served as controls. FCD, RBC-velocity and -flux remained unchanged in the 2-h group. IP was encountered in 87% of all observation areas at 120 min. After 18-h ischemia, FCD was significantly reduced, which was paralleled by a 50% incidence of IP at 120 min. Tissue edema and leukocyte infiltration in pancreas grafts following 18-h preservation were significantly enhanced. Therefore, IP is an important mechanism aimed at improving microcirculation and UW solution is suitable to preserve vasomotion-activities enabling long-term preservation in a pancreas