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DIRECT EVIDENCE FOR THE CONTRACTILITY OF ENDOTHELIAL CELLS. F. De Clerck and M. De Brabander. Laboratories of Haematology and Oncology, Janssen Pharmaceutica Research Laboratories, Beerse, Belgium.

Dog aorta endothelial cells, grown in culture, were resuspended in human citrated (Na_3 . citrate . $2H_2O$, 0.313 %) platelet-free plasma (PFP) at cell densities between 2 and 0.5 x 10^6/ml. Fractions (60 % PFP) were coagulated at 37°C with thrombin, 2 N.I.H. U/ml, in the presence of barbital-HCl buffer pH 7.35 (40 %) and $CaCl_2$ 5 x 10^{-4} M. Endothelial cells stimulated with thrombin induced clot retraction, the onset and degree of which depended upon cell density, cellular integrity, homogeneous cell distribution and availability of extracellular Ca^{2+}. Contraction was completely inhibited by EGTA (8 mM), by papaverine (10^{-3} M)-induced phosphodiesterase inhibition and by VK 774 (10^{-4} M)-induced inhibition of glycolysis. It was partly reduced by nocodazole (1 µg/ml)-induced microtubuli disruption, by cytochalasin B (1 µg/ml) and by verapamil (10^{-4} M)-induced intracellular Ca^{2+}-blockade, but was unaffected by PGE_1 (3.3 µg/ml) and by the cycloxygenase inhibitor suprofen (10^{-4} M). E.M. examinations revealed pseudopod formation and interaction of the cells with fibrin strands. The contractile capacity of endothelial cells may contribute to the regulation of blood flow distribution in the microcirculation.

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PERIPHERAL VASCULAR DISEASE: COMPARATIVE ULTRASTRUCTURE OF VEINS, VALVES AND ARTERIES. R.L. Reddick, T. Griggs, A. Romanenko, and K.M. Brinkhous. Department of Pathology Univ. N.C., Chapel Hill, N.C.

Ultrastructural changes in the coronary and cerebral arteries in thromboatherosclerosis have been well documented. Similar detailed studies in peripheral vascular disease (PVD) have not been described. Since PVD is frequently complicated by venous thrombosis, a comparative study of the arterial and venous pathology in patients with occlusive peripheral atherosclerosis was done. Anterior tibial artery and accompanying veins from seven cases were studied by light, transmission and scanning microscopy. Endothelial cell morphology was abnormal in all arteries. Cells contained lipid inclusions, prominent lysosomes, and cytoplasmic filaments were disorganized. Cell junctions were altered. Endothelial cells from both the vein wall and valve were morphologically normal. Basement membrane was reduplicated in both arteries and veins. In some arteries, the basement membrane was partially obscured by the atheromatous changes. Elastic lamina in veins, valves and arteries was fragmented. Smooth muscle cells of the arterial intima has significant morphologic alterations. The cells had a disorganized pattern and contained glycogen granules, lipid droplets and lysosomes in association with lipid. The filamentous pattern was disorganized and many cells appeared devoid of a basement membrane. Pinocytic vesicles were clearly evident. Smooth muscle cells comprising vein wall and valve were unremarkable. Collagen in arteries, veins and valves was haphazardly arranged with variation in fibrillar size. In some arteries, fibrous type collagen was found. Irregular, smudged collagen was present in all vessels examined. Calcification was noted in arteries only. These findings show a) a diversity of transmural alterations in arterial wall and b) ultrastructural changes in collagen in venous wall. The former is associated with thrombotic events, the latter not.

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THE EFFECT OF DEXAMETHASONE ON BASEMENT MEMBRANE PRODUCED BY CULTURED HUMAN ENDOTHELIAL CELLS. F. Piovella, M.M. Ricetti, P. Almasio E. Ascari°. Istituto di Clinica Medica I° e °Istituto di Patologia Medica I°, Università di Pavia, 27100 Pavia, Italy.

Human endothelial cells from umbilical cord vein were grown to confluence on glass coverslips placed in Petri dishes, in the presence or absence of dexamethasone. After ten days in culture, the cell monolayers were washed and treated with 0.5% Triton X 100 in Hank's solution. The detergent-treated slides were then washed in Hank's and examined by indirect immunofluorescence for fibronectin utilizing monospecific antibodies. Basement membranes produced by dexamethasone-treated cells showed a more intense fibrillar network of extensively overlapping fluorescent fibers if compared with controls.
The effect of these pre-formed basement membranes on cellular spreading was subsequently studied. Human endothelial cells, previously grown in culture medium without steroids, were detached by trypsin-EDTA solution, washed and cultured on the slides covered with the extracellular matrix pre-formed in the presence or absence of dexamethasone. The higher fibronectin content of basement membranes pre-formed in the presence of dexamethasone allowed a more rapid attachement and a better spreading of endothelial cells if compared with control pre-formed basement membranes.