

INTERCELLULAR CONTACTS BETWEEN SMOOTH MUSCLE CELLS IN THE NEOINTIMA OF THE AUTOGENOUS REVERSED SAPHENOUS VEIN GRAFTS

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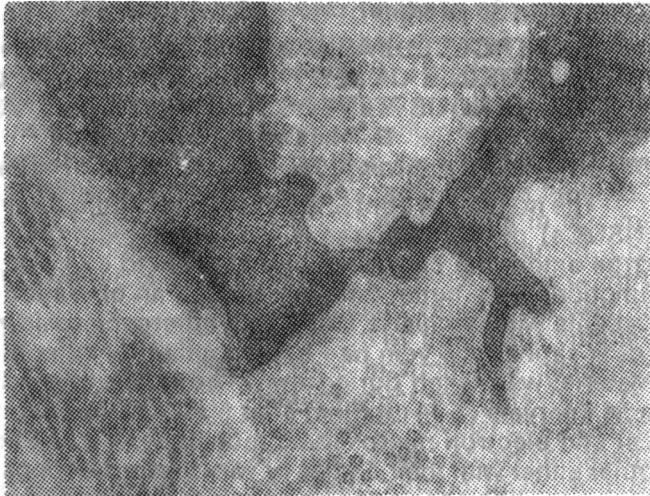
The manner of contacts between neointimal smooth muscle cells (NSMCs) of the autogenous saphenous vein grafts determine to a large extent the capability of that layer to carry out one of its basic functions - the buffer one. We studied an operation material from 10 patients with occlusive lower limb atherosclerosis in which reversed great saphenous vein had been applied for arterial bypass grafting. Material was taken during the 2nd operation performed in different time intervals (7-24 months) after first one. We used routine histological and electron microscopic techniques (3). NSMCs contact each other either with their bodies or with thin projections varying in length and with different space orientation. When cells contact with their bodies (fig.1) their basal lamines become thin or disappear and both cell membranes come closer by opposite large based cytolemmal evaginations. They form contact gaps 20-40 nm wide filled up with



*Fig.1. NSMCs connected with their bodies
TEM x 30 000*

material of equal or higher electron density as compared to basal lamines of NSMCs named intermediate junctions (1,2). At the other parts of contact area connecting cell membranes form contact gaps 20-30 Å wide named nexus or gap junctions (2,4,5). Junctions without contact gap can be seen, too.

NSMCs do not form bundles and they are usually separated by an extracellular matrix. Thus they form relatively few specialized intercellular contacts. When NSMCs contact with their projections (fig.2), they form contact gaps similarly to these described above. Junctions without contact



*Fig.2. NSMCs connected with thin projections.
TEM x 30 000*

gap can be seen, too. Basal lamina passes the edges of contact cell membranes from one SMC to another surrounding the contact area. In some cases it is absent and bundles of collagen fibres with longitudinal space orientation can be observed in close proximity to contact cell membranes. Some projections connect with bodies of the adjacent NSMCs. More than two projections in different space planes can connect at the same contact area. NSMCs need certain ability to dislocate one to another to realize the neointimal buffer function despite the scanty elastic fibres in their extracellular matrix (3). The intercellular contacts must be strong to endure the dilation caused by arterial blood pressure variation. These necessities are met by following important peculiarities in ultrastructure of the contacts between NSMCs: filling up of the contact gap with electron dense material; common basal lamina; additional strengthening of the contact by longitudinally oriented bundles of collagen fibres; direct contact between the cell membranes.

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