

# Angiogenesis and inflammatory cell infiltration in lumbar disc herniation.

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## Abstract

**STUDY DESIGN:** Immunohistochemical study of the angiogenesis and inflammatory cell invasion in lumbar disc herniation. **OBJECTIVES** To observe the blood vessel formation within the extracellular matrix in lumbar disc herniation, and to elucidate the role of angiogenesis in the natural shrinking of hernias. **SUMMARY OF BACKGROUND DATA:** There have been few reports of detailed observation of blood vessel formation within the extracellular matrix, and the role that angiogenesis plays in the natural shrinking of hernias has not been elucidated. **METHODS:** Twenty tissue samples surgically removed from 17 patients with herniated discs were studied (9 men, 8 women, 23-58 years old, 11 extrusion type, 9 sequestration type). In the immunohistochemical study, an anti-CD34 antibody for vascular endothelial cells, an anti-CD68 for macrophages, and an anti-vascular endothelial growth factor antibody was used for vascular endothelial growth factor. **RESULTS:** Many spindle-shaped cells expressing vascular endothelial growth factor were seen inside granulation tissue infiltrating the cartilage matrix, and the number of vascular endothelial growth factor-positive cells and the number of CD34+ cells were positively correlated ( $R = 0.73$ ,  $P < 0.001$ ). In the area surrounding CD34+ cells that had formed a lumen, many CD68+ cells were observed, and the number of CD34+ cells and the number of CD68+ cells were positively correlated ( $R = 0.66$ ,  $P < 0.001$ ). **CONCLUSIONS:** The results suggest that the vascular endothelial growth factor produced by the spindle-shaped cells acts to promote angiogenesis inside granulation tissue infiltrating the cartilage matrix, and that new blood vessels play an important role as a passage for macrophages into the degenerated matrix.

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