Expression of Collagens in the Otosclerotic Bone

Abstract:
The etiopathogenesis of otosclerosis is still controversially discussed. The major hypotheses discussed are a viral infection on a genetic background and an (autoimmune) collagen disease. The aim of our study was to investigate by immunohistochemistry the expression pattern of collagens within the otosclerotic focus. Stapes footplates from 30 patients with clinical otosclerosis undergoing stapedectomy were formalin fixed, decalcified and paraffin embedded. As controls, 30 autopic temporal bone specimens were employed. We investigated the expression of collagens I-V with immunohistochemistry. The expression of collagen I showed a diffuse homogeneous distribution with increased staining of the otosclerotic focus. Collagen II was exclusively expressed in chondrocytes including the globuli interossei. The pattern of collagen III in the otosclerotic bone was web-like in contrast to a lamellar pattern in the control bone. The mucoperiosteal layer and connective tissue such as the vessels of the resorption lacunae expressed collagen IV. An increased expression of collagen V around osteocytes was observed in the otosclerotic focus. In conclusion, in the otosclerotic tissue, in comparison with the control bone, a high expression of collagen IV occurred. The immunohistochemical analysis of collagen II, which has been suggested to be implicated in the etiopathogenesis of otosclerosis, revealed no differences between control and otosclerotic bones. The intense staining of the otosclerotic focus with collagen I is in good
agreement with an inflammatory process but in contrast with lesions like those in osteogenesis imperfecta.