Conjunctival Expression of Adhesion Molecules In Mooren's Ulcer

C. Stephen Foster, MD

Mooren's ulcer is by definition an idiopathic progressive ulceration of the peripheral cornea, not involving sclera, and not associated with underlying systemic disease. It appears to be provoked by a number of stimuli, including trauma and infection by a variety of microbes. Conjunctival stroma contains a vast array of immunocompetent cells, especially near the limbus, in patients with Mooren's Ulcer, and removal of the immunologic "machinery" is typically ameliorating of the progressive ulcerative process, sometime curative in unilateral cases, and at least temporizing in bilateral cases, until conjunctiva regrows and is repopulated by the inflammatory cells that begin to produce the cytokines that appear to be responsible for attraction of the macrophages and neutrophils that digest the corneal stromal and cause the ulcer to develop and progress.

We examined the pattern of leukocyte adhesion molecule expression in conjunctiva in patients with Mooren's Peripheral Ulcerative Keratitis. An expression of the leukocyte adhesion molecules was determined by immunohistochemical analysis of frozen sections of cryopreserved human conjunctiva resected at the time of surgical therapy of patients with Mooren's ulcer; probing was with monoclonal antibodies directed against VCAM-1, VLA-4, ICAM-1, LFA-1, E-selectin, and HLA-DR molecules. Anti-CD 25 MAB was applied to determine the presence of activated T-lymphocytes. We obtained specimens from six patients with progressive Mooren's Ulcer, from five patients with peripheral ulcerative keratitis secondary to other causes, and from patients with normal conjunctiva undergoing cataract surgery.

VCAM-1 and LFA-1 were expressed in significantly higher amounts on the conjunctival epithelia of patients with Mooren's Ulcer than in patients with PUK secondary to other causes. VCAM-1 was also significantly greater on connective tissue cells with substantia propria in patients with Mooren's Ulcer. LFA-1 and ICAM-1 were predominantly associated with inflammatory cells along the basement membrane zone. ICAM-1 and VCAM-1 were significantly more expressed in the conjunctival vascular endothelial cells of patients with Mooren's Ulcer as compared to patients with peripheral corneal ulcers secondary to other causes. Variable expression of other LAMs, CD-25, and HLA-DR was noted in both conditions.

We conclude that the expression of VCAM-1 and LFA-1 is greater in conjunctiva from patients with Mooren's Ulcer than in patients with peripheral keratitis secondary to other causes. Additionally, VCAM-1 and ICAM-1 expression on the vascular endothelium is also significantly greater in the conjunctiva of patients with Mooren's Ulcer. This may explain the greater cell recruitment that occurs in the peripheral cornea of patients with Mooren's Ulcer, and hence may explain the more progressive, destructive nature of this disease.