Session 6: 1:00 pm

Ankle Intra-articular Pathology Correlation with Cytokine Inflammatory Biomarkers and Degradation Products

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Summary:
There are differences in cytokine levels of FAC and MCP-1 with increasing grades of severity of intraarticular pathology. Their identification within synovial joint aspirate may play a role as biomarkers in determining necessity of arthroscopy in equivocal candidates.

Introduction:
Cytokine inflammatory biomarkers and fragments of structural matrix proteins have been identified in the pathophysiology of disc disease and of painful conditions of synovial joints. A Fibronectin-Aggregan Complex (FAC) has previously been identified in painful meniscal pathology. The FAC has also been associated with relief of symptoms following successful treatment of radiculopathy due to lumbar herniated disc. We sought to investigate the presence of inflammatory cytokines and the FAC in individuals undergoing ankle surgery.

Methods:
Three groups were enrolled: diagnostic arthroscopy with/without procedures, positive controls with advanced arthritis undergoing arthroplasty or arthrodesis, and negative controls who received aspiration at the time of forefoot surgery. The fluid aspirate was assayed for cytokines IL-6, interferon-gamma (IFN-g), MCP, MIP-1 beta, as well as FAC. Severity of intraoperative findings were graded by arthroscopic visualization or gross inspection. Negative controls were classified as grade 0, and were defined as patients with a VAS of 0. Upon ankle arthroscopy, patients with none or mild synovitis/chondrosis were classified as grade 1. Patients with moderate/severe synovitis/chondrosis, OCD, anterior impingement syndromes, or loose body were classified as grade 2. Positive controls undergoing total ankle arthroplasty or ankle arthrodesis were graded as 3.
Results:
There were 41 patients, 23 males and 18 females (mean age 45, range 18-76) and a mean pre-procedure VAS of 4.6. There were 4 positive controls, and 13 negative controls. Of the 24 undergoing arthroscopy, 7 were grade 1 and 17 grade 2. The grade of intra-articular pathology was significantly related to age, preoperative VAS, FAC, IL-6, and MCP-1 (p < 0.05). FAC and MCP-1 were significant predictors of pathology (p < 0.05). The mean values of the inflammatory marker MCP-1 in pg/ml were 49.8 (±8.0) for minimal pathology and 133.9 (±33.0) significant pathology. The mean values of FAC in optical density at 450nm were 2.83 (±1.16) for minimal pathology and 9.62 (±2.23) for significant pathology.

Conclusion:
There are differences in cytokine levels of FAC and MCP-1 with increasing grades of severity of intraarticular pathology. Their identification within synovial joint aspirate may play a role as biomarkers in determining necessity of arthroscopy in equivocal candidates.