**Introduction:** Inflammation in the subacromial bursa can be a source of pain in patients with rotator cuff disease. Mechanical impingement in the subacromial space can induce and worsen inflammation. It has been reported that cytokines and growth factors may play a role in the inflammatory process. However, the exact roles of cytokines, growth factors, and other proteins during the inflammatory response are currently unknown. The purpose of our study is to examine the gene expression profile of cytokines/receptors and extracellular matrix, adhesion molecules of bursa samples derived from the patients with impingement syndrome and compare it with that of normal bursa. Understanding the basic mechanisms behind the pathogenesis of bursitis may lead to the development of new treatment regimens for this common and painful condition.

**Materials and Methods:** Subacromial bursa tissues were obtained intraoperatively from patients during shoulder surgery and analyzed using cDNA Array technique. 22 patients (mean age 53.2, range 19-80) were candidates for this study. They were divided into two groups: Group I; bursitis from 18 patients with impingement syndrome, Group II; normal bursa from 4 patients with instability or fracture. Samples were placed in RNAlater solution (Ambion, Austin, TX) immediately after surgery and frozen at -70°C within 2 hours of suspension. RNA was extracted from the samples using the RNeasy Fibrous Tissue Mini Kit (Qiagen, Valencia, CA) and stored at -70°C. Complementary DNA-array hybridization was done using GEArray Q Series Kits (SuperArray, Frederick, MD) for inflammatory cytokine/receptor genes and human extracellular matrix, adhesion molecule genes in subacromial bursa specimen. The gene expression of human extracellular matrix (MMP 11, MMP 12) and adhesion molecules (Collagen IV, ITGA5, ITGA7, ITGB1 and SSP1) was increased in Group I (bursitis) compared to Group II (normal bursa) (p<0.05). The expression of several cytokine receptor genes (IL1R2, IL6r, IL12RB2, IL13RA and IL15RA) was increased in Group I compared to Group II (p<0.05).

**Results:** The expression of several cytokine genes (IL1A, IL1B, IL6, IL12A, IL15, IL16 and SDF-1) was increased in Group I (bursitis) compared to Group II (normal bursa) (p<0.05). The expression of several cytokine receptors (IL1R2, IL6r, IL12RB2, IL13RA and IL15RA) was increased in Group I compared to Group II (p<0.05). The gene expression of human extracellular matrix (MMP 11, MMP 12) and adhesion molecules (Collagen IV, ITGA5, ITGA7, ITGB1 and SSP1) was increased in Group I (bursitis) compared to Group II (normal bursa) (p<0.05).

**Discussion:** While inflammation in the subacromial bursa has been implicated in the pathophysiology of patients with impingement syndrome, the exact roles of cytokines and other proteins during this inflammatory process are currently unknown. These initial data demonstrate that many inflammatory cytokines and extracellular matrix/adhesion molecules are increased significantly in the subacromial bursa of patients with impingement syndrome. The role of inflammation in the pathophysiology of impingement support the use of anti-inflammatory medication and subacromial bursectomy in the treatment of these patients. Further investigation will emphasize the isolation, characterization, and localization of these genes.