

SHOULDER IMPINGEMENT; EVALUATION OF THE CLINICAL OUTCOME, RADIOGRAPHIC FINDINGS, HISTOLOGY, ULTRASTRUCTURE AND BIOCHEMISTRY

AKADEMISK AVHANDLING

Som för avläggande av medicine doktorexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligens försvaras i Hörsal Arvid Carlsson Academicum, Medicinaregatan 3, Göteborg, den 7 december 2018, klockan 09:00 av **Stefanos Farfaras Leg. läkare**

FAKULTETSOPPONENT

Docent **Hans Rahme**
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AVHANDLINGEN BASERAS PÅ FÖLJANDE DELARBETEN

- I. Comparison of open acromioplasty, arthroscopic acromioplasty and physiotherapy in patients with subacromial impingement syndrome: a prospective randomised study.**
Farfaras S, Sernert N, Hallström E, Kartus J.
Knee Surg Sports Traumatol Arthrosc. 2016 Jul;24(7):2181-91.
- II. Subacromial decompression yields a better clinical outcome than therapy alone: a prospective randomized study of patients with a minimum 10-year follow-up.**
Farfaras S, Sernert N, Rostgard Christensen L, Hallström EK, Kartus JT.
Am J Sports Med. 2018 May;46(6):1397-1407.
- III. More histologic and ultrastructural degenerative signs in the subscapularis tendon and the joint capsule in male patients with shoulder impingement.**
Farfaras S, Ejerhed LE, Hallström EK, Hultenby K, Meknas K, Movin T, Papadogiannakis N, Kartus JT.
Knee Surg Sports Traumatol Arthrosc. 2018 Jan;26(1):79-87.
- IV. Increased amount of inflammatory markers in the subscapularis tendon and joint capsule in patients with subacromial impingement.**
Farfaras S, Roshani L, Mulder J, Mitsios N, Hallström E, Kartus J.
Submitted Am J Sport Med.

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ABSTRACT

This thesis had two main purposes: on the one hand, to assess and evaluate the clinical outcome of different treatment strategies for subacromial impingement syndrome (SAIS), in both the short and the long term and, on the other hand, to investigate and illuminate the pathophysiology of the syndrome in terms of the radiographic, histological, ultrastructural and biochemical appearance.

In Study I, the clinical outcome was assessed two to three years after intervention, in patients with SAIS who underwent either surgical (subacromial decompression using the open or arthroscopic technique) or non-surgical treatment. Eighty-seven patients with SAIS were randomised to three groups: open acromioplasty (OSG), arthroscopic acromioplasty (ASG) or physical treatment (PTG). The main outcome measurement, the Constant Score, showed no significant difference when comparing the three groups before intervention and at follow-up. However, when comparing each group separately over time, the two surgical groups had improved significantly at follow-up. The Watson & Sonnabend score had improved significantly for more parameters in the OSG, compared with both the ASG and PTG. Furthermore, the OSG revealed a better outcome for strength measurement at follow-up. In Study II, the same group of patients was assessed, a minimum of 10 years after intervention, for the same clinical outcomes. In addition, the development of osteoarthritis (OA) and rotator cuff tears was assessed. In the long term, the surgical groups revealed a better outcome. The Constant Score increased significantly more over time (baseline vs follow-up), for both the OSG and the ASG compared with the PTG. Moreover, the OSG had a significantly better Constant Score compared with the PTG, when comparing the three groups. Both surgical groups also revealed better strength and better active elevation. Radiographically, no differences in OA or rotator cuff tears were found between the three treatment groups.

In Study III, the histological and ultrastructural appearance of tissue samples from the subscapularis tendon and joint capsule were assessed. Male patients with SAIS were compared with male patients with recurrent shoulder dislocations, in terms of degenerative signs. The fibril diameter and the Total Degeneration Score (TDS) were assessed. The SAIS group was significantly older than the instability group, but the correlation coefficient between age and fibril diameter was $r = -0.20$ for the subscapularis tendon and $r = -0.25$ for the capsule. The instability group had significantly "thicker" fibrils compared with the SAIS group and a better TDS. This indicates the presence of a degenerative process in patients with SAIS. In Study IV, the expression of different inflammatory markers in the same population was assessed. The analysis of the samples revealed a significantly larger amount of interleukin-6 (IL-6) and tumour necrosis factor- α (TNF- α) in the subscapularis tendon of patients with SAIS. In the capsular samples, a significantly higher TNF- α and cluster of differentiation 72 (CD 72), a marker of B-cell activity, was found. This indicates that an inflammatory process is present in patients with SAIS, both in the subscapularis tendon and in the adjacent joint capsule.

Keywords: Shoulder impingement, shoulder pain, subacromial decompression, physiotherapy, pro-inflammatory cytokines, tissue degeneration

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