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Anxiety and depression predict poor outcomes in arthroscopic subacromial decompression

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Background: Subacromial impingement is common and frequently treated with arthroscopic subacromial decompression (ASD); however, its efficacy has recently been questioned. Poor surgical outcomes have been associated with anxiety and depression within other orthopedic subspecialties but not within this group of patients. We hypothesized that anxiety and depression are associated with worse outcomes after ASD.

Methods: A retrospective review of prospectively collected data was carried out of patients undergoing ASD. Inclusion criteria were short-term relief with injection therapy and presence of Hawkins sign. Rotator cuff tears were excluded. Patients completed the Oxford Shoulder Score (OSS), Hospital Anxiety and Depression Scale (HADS), and visual analog scale for pain before and after surgery in outpatient clinic follow-up at 6 weeks and by postal questionnaire at 6 months.

Results: The 86 patients who participated in the study were analyzed in 2 groups defined by HADS scores, group A being depressed and group B nondepressed. Both groups had less pain and improved OSS at 6 months; however, group B improved faster with improved scores at 6 weeks, which were maintained to 6 months. Group B had less pain and higher OSS at 6 months than group A. There was strong negative correlation ($P < .01$) between preoperative HADS score and 6-week and 6-month OSS and HADS scores. There was strong positive correlation ($P < .01$) between HADS score and 6-week and 6-month pain scores. High preoperative HADS score was negatively correlated to 6-month satisfaction ($P < .05$).

Conclusion: Patients with HADS score >11 before ASD have worse outcomes. This should be taken into account when counseling patients for surgery.

Level of evidence: Level II; Retrospective Design; Prognosis Study

Keywords: Subacromial; impingement; depression; anxiety; arthroscopic; decompression

Subacromial impingement (SI) is a common problem with an estimated diagnosis in almost half of all shoulder pathologic processes presenting to general practice.[10] Treatment is traditionally nonoperative in the initial phase with physiotherapy, analgesia, and corticosteroid injection therapy. Surgery is considered when patients fail to improve after these conservative measures.

Recent studies have demonstrated improved clinical outcomes in a selected group of patients with consistently positive

It was agreed with the Sherwood Forest Hospitals NHS Foundation Trust that patients were being retrospectively analyzed from prospectively gathered data and treatment was not influenced by the depression group and additionally the standard treatment protocols of our hospital were being adhered to without any abnormal treatment and with follow-up. Therefore, Ethical Committee approval was deemed unnecessary.

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clinical and radiologic signs of SI.[16] The importance of psychological factors in influencing the outcome of surgical treatment is also now emerging in various elective orthopedic procedures.[4,19-21] This raises the question of whether surgery can be more effective in a certain group of patients and is therefore more appropriate.

There is growing concern that patients with high levels of anxiety and depression respond poorly to surgical intervention. This has been demonstrated in hip and knee surgery by comparing functional outcomes and quality of life scores with preoperative anxiety and depression scores.[3,4,19,20] Recent studies investigating clinical outcomes in patients with rotator cuff tears have had conflicting results, however, with some studies demonstrating that anxiety and depression, although negatively correlated with preoperative patient-reported pain, function, and quality of life,[6,7,18] are not predictive of poor surgical outcomes.[7,17] In fact, it has recently been found that rotator cuff repair improves anxiety and depression and gives a better quality of life in depressed patients.[7,8]

To our knowledge, there has been no research into the correlation of outcome of arthroscopic subacromial decompression (ASD) for SI and preoperative anxiety and depression. This study aimed to determine whether a high preoperative anxiety and depression score is associated with a worse functional outcome in ASD for SI.

Materials and methods

We performed a retrospective study from consecutive patients undergoing ASD during a 9-month period (October 2012 to June 2013) in our unit. Our inclusion criteria were patients with isolated SI aged between 25 and 75 years with shoulder pain on overhead activity or in the mid arc of abduction, a positive Hawkins test result on repeated examination, pain relief of a minimum of 2 weeks after subacromial steroid injection, and radiologic evidence of impingement (sclerosis, cysts, or osteophyte at the grater tuberosity and acromion). We excluded those patients who had previously been treated by ASD or previous shoulder surgery. Patients with other concurrent shoulder diseases were excluded, including SI accompanied by rotator cuff tear (partial or full thickness) on preoperative ultrasound scan, acromioclavicular arthritis, calcific tendinitis, calcific bursitis, adhesive capsulitis, labral tear, biceps tendinitis, superior labral anterior-posterior tear, and instability. Basic demographic data were collected for each patient. A functional assessment to characterize the severity of the patient's disease was performed before ASD. Every patient completed a questionnaire that included the Hospital Anxiety and Depression Scale (HADS),[24] Oxford Shoulder Score (OSS),[9] and visual analog scale (VAS) for pain on the day of the ASD procedure. The HADS is a fully validated and comprehensive outcome measure[2,22,23] consisting of 14 questions about anxiety and depression and takes <5 minutes to complete. A score of >11 defines a case of possible depression. The HADS was developed as a simple screening tool and does not prove clinical depression; however, it provides a robust and simple means for quantitatively evaluating the mental state of a patient, which is more relevant to this study.[22,24] Because there are many nondiagnosed cases of anxiety and depression and the efficacy of treatment or severity of the disease would be difficult and time-consuming to quantify in a typical outpatient clinic setting, the HADS provides a tool for screening all patients and can be completed by the patients themselves. Because this is the nature of the questionnaire, a score of 11 does not specifically indicate that any individual line of treatment is appropriate but rather that further investigation and treatment may be necessary. The patient group was therefore not defined by clinical diagnosis of anxiety or depression.

All ASD procedures were performed by 1 surgeon (the senior author) using standard posterior and lateral portals. This was under general anesthesia or regional block anesthesia in the beach chair position with patients discharged the same day in a sling. The surgeon was blinded from the results of the questionnaire.

Patients were reviewed in clinic at 6 weeks by the authors of the study, where they completed a second questionnaire assessing pain and satisfaction on a 0- to 10-point VAS and a repeated HADS and OSS, and physiotherapy was continued. At 6 months, the second questionnaire was repeated by mail. If no response was received, a repeated questionnaire was sent.

Our local hospital trust informed us that no formal ethical approval was required for this study because this study was a health service evaluation to determine the outcomes of treatment with no deviation from routine practice. Scoring was evaluated after completion of treatment and did not influence operative decision-making.

Data were analyzed using SPSS (IBM SPSS Statistics for Macintosh, version 20.0; IBM Corp, Armonk, NY, USA). Power analysis was performed using G Power version 3.1.[11] Population data were found to be abnormally distributed by Shapiro-Wilk analysis ($P < .05$); therefore, nonparametric tests were used.

The paired *t*-test was used to determine a difference between preoperative and postoperative outcome measures. The Wilcoxon signed rank test for paired abnormally distributed data was used to assess for statistical significance between groups. Correlation of preoperative HADS scores to postoperative outcome measures was performed using Spearman rank correlation.

Subgroup analysis of patients receiving disability living allowance (government-provided income support for chronic sickness) was performed using the same statistical method.

No pilot study was performed on this original research; therefore, no a priori analysis could be performed to determine sample size. A post hoc power analysis was performed using the final outcome measure of OSS at 6 months, and our sample size generated a power of 99% at a 5% level of