

Prospective Evaluation of the Impingement Test as an Independent Predictor of Rotator Cuff Integrity

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Background: Accurately determining the presence of a rotator cuff (RC) tear by physical exam alone can be a challenge. The presence of a positive impingement sign in conjunction with significant RC weakness can assist in diagnosing a RC tear. However, in the presence of pain the accuracy of assessing a positive impingement sign as well as RC weakness can be difficult.

Purpose: The purpose of this study was to determine whether a change RC strength would be seen in individuals presenting with potential RC tears following a lidocaine injection. A general increase in strength subsequent to lidocaine injection may indicate a means for more accurate evaluations of RC strength—which we believe would propose a comprehensive method for obtaining highly accurate evaluations of strength of the RC.

Design & Setting: Subjects were recruited from a an academic orthopedic shoulder clinic with complaints of shoulder pain likely coming from RC pathology.

Subjects: Forty-one consecutive patients who were 18 years or older with RC strength as assessed by manual muscle testing of greater than a 3/5 and no neurological findings were evaluated. After history and detailed physical exam, the patients underwent dynamometer strength testing by an independent evaluator.

Methods: Based upon the provisional diagnosis of a RC tear, as determined by positive impingement signs and objective weakness of the affected shoulder in internal rotation, external rotation, and/or abduction as measured by dynamometry, the patients were consented to enroll in this diagnostic study. Each patient had 10cc of 1% Lidocaine injected in a sterile fashion into the subacromial space. Strength testing was repeated after fifteen minutes with confirmation of improvement in the impingement signs. Strength measurements were compared to pre-injection measurements to determine any change in strength in abduction, external rotation, and internal rotation. Each patient had advanced diagnostic imaging (MRI or CT arthrogram) to determine the presence of a tear.

Results: There was no statistically significant difference in the change in strength measurements between the groups with and without RC tear. In the group without a cuff tear, the mean difference in strength after and before subacromial injection was 0.3 kgs for abduction, 0.3 kgs for external rotation, and 1.1 kgs for internal rotation. In patients with a cuff tear, mean difference in strength was 0.7 kgs for abduction, -0.4 kgs for external rotation, and 1.5 kgs for internal rotation.

Conclusion: A positive change to an impingement test did not allow for any inference to be made as to the status of RC integrity based upon dynamometry measurements.

Clinical Relevance: It appears that the reduction of pain to better assess RC strength does not assist in predicating the presence of a RC tear.