CLINICAL DIAGNOSIS OF SUBSCAPULARIS TENDON TEAR USING THE BEAR HUG SEMIOLOGICAL MANEUVER

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ABSTRACT

Objective: To evaluate the Bear Hug maneuver for clinically diagnosing subscapularis tendon tears, and compare this with other maneuvers described previously (Lift-off, Napoleon and Belly Press). Methods: Forty-nine patients with rotator cuff injuries who had undergone arthroscopy to repair the injury and had previously been assessed using the semiological maneuvers mentioned above were evaluated. Results: The diagnostic values obtained for the Bear Hug test were as follows: sensitivity 75%, specificity 56%, positive predictive value 62%, negative predictive value 70% and accuracy 65%. Conclusion: The highest sensitivity and negative predictive value values were obtained with the Bear Hug test. The highest specificity value was seen with the Lift-off test. The Belly press test gave the greatest specificity, positive predictive and accuracy values.

Keywords – Shoulder; Arthroscopy; Rotator Cuff; Tendon Injuries

INTRODUCTION

Rotator cuff injuries are an important cause of pain and functional incapacity of the shoulder[1,2]. With increasing life expectancy among the population and the popularization of modern diagnostic methods, partial and total lesions of the shoulder are becoming increasingly common[3]. Lesions of the subscapularis occur more frequently in association with lesions of the long portion of the biceps and/or lesions of the other tendons of the rotator cuff[4-6]. Lesions of the subscapularis alone are uncommon[1,7].

Although the subscapularis is the largest muscle of the rotator cuff, with its tendon covering the entire anterior surface of the shoulder joint, isolated lesions of the subscapularis only occur in 2.1% to 10.5% of the patients with shoulder tendon injuries[1,3,8,9]. Because of the low reported incidence, little importance was given to lesions of the subscapularis in the scientific literature until 1991, when Gerber and Krushell[10] described a series of cases of isolated lesions of the subscapularis.

From then onwards, semiological maneuvers for diagnosing these lesions started to be described in the literature worldwide. Gerber and Krushell (1991)[10] described a test named lift-off and in 1996, Gerber *et al*[11] described another test, known as belly press. In 2002, Burkhart and Tehrany[12] defined the Napoleon test[12]. However, none of these maneuvers presented satisfactory sensitivity and specificity, thus resulting in low positive predictive values.

In successive arthroscopy procedures, Barth *et al*[13] observed that several lesions of the upper portion of the subscapularis tendon were not foreseen by the belly press and lift-off maneuvers, given that the uppermost

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fibers were only recruited in situations of internal rotation of the shoulder with the elbow in the most anterior position[13]. Searching for a maneuver with greater accuracy that would enable quantification of the lesion, Barth *et al* (2006)[13] described the bear hug test. In this semiological maneuver, the patient is placed in an upright standing position. The hand ipsilateral to the affected shoulder is positioned on the contralateral shoulder with the fingers stretched out and elbow positioned anteriorly to the body. The patient is asked to maintain this position (resisted internal rotation) while the examiner tries to perform external rotation through applying a force to the patient's forearm so as to remove his hand from his shoulder (Figure 1). If the patient is unable to keep his hand on his shoulder, or the resistance is 20% less than that of the contralateral side, the test is considered to be positive. Force equivalent to that of the other side and absence of pain define the test as negative. The result is considered to be intermediate when the patient is able to resist the examiner's force, but says that it was painful to do so.

Our main objective was to evaluate the diagnostic capacity of the bear hug maneuver for lesions of the subscapularis, taking arthroscopic examination as the gold standard. The secondary objective of this study was to compare this maneuver with the tests described previously (lift-off, Napoleon and belly press)

MATERIALS AND METHODS

Between August 2008 and March 2009, all patients attended at the shoulder and elbow outpatient clinic with complaints of shoulder pain, with or without associated trauma, were examined by a physician who was a specialist in shoulder complaints (with more than 250 arthroscopic procedures performed and four years of experience). After taking the patient's history, a complete physical examination was performed on the shoulder, consisting of inspection, palpation and special tests. These included the belly press, lift-off, Napoleon and bear hug test, i.e. the subject of the present study. All of these tests assess lesions of the subscapularis tendon. In addition, tests to evaluate the integrity of the supraspinatus, infraspinatus and long head of the biceps were performed.

The bear hug maneuver was performed as described by Barth *et al*[13] and its results were graded as explained in Table 1.

Magnetic resonance imaging examinations were performed on patients with suspected rotator cuff injuries. Patients with this diagnosis and with an indication for surgery underwent arthroscopic repair of the lesion. The surgical indication was pain, with or without associated diminution of muscle strength, in

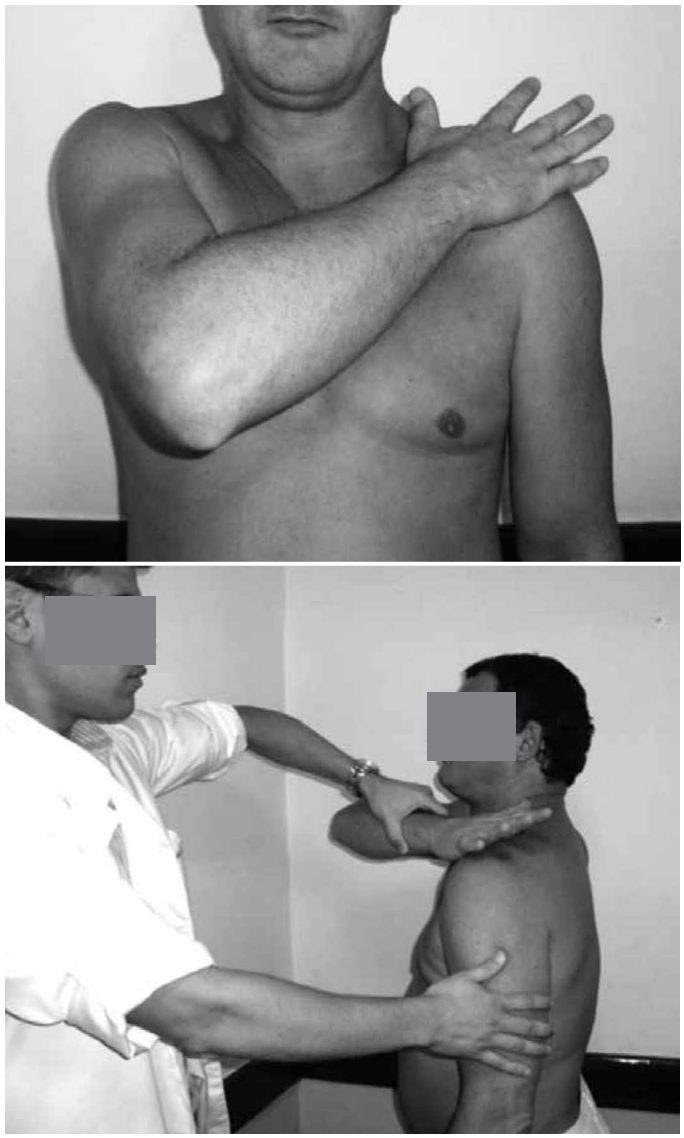

Figure 1 – Bear hug semiological maneuver as described by Barth et al[13]. The patient is placed in an upright standing position. The hand ipsilateral to the affected shoulder is positioned on the contralateral shoulder with the fingers stretched out and the elbow positioned anteriorly to the body. The patient is asked to maintain this position (resisted internal rotation) while the examiner tries to perform external rotation by applying a force on the forearm so as to remove the patient's hand from his shoulder. If the patient is unable to keep his hand on his shoulder, or the resistance is 20% lower than on the contralateral side, the test is considered to be positive. If the force is equivalent to that of the opposite side and pain is absent, the test is defined as negative.

Table 1 – Possible results from the bear hug maneuver.

Type	Grading of the bear hug test
0	Normal: absence of pain and grade 5 muscle strength
1	Intermediate: pain and grade 5 muscle strength
2	Positive: grade 4 muscle strength