THE PREDICTIVE VALUE OF CLINICAL TESTS FOR SHOULDER INSTABILITY

*Walton, J; *Tzannes, A J; +*Murrell, G AC
+*Orthopaedic Research Institute, University of New South Wales, St George Hospital Campus, Kogarah (Sydney) NSW Australia. 4-10 South Street, Level 2, Kogarah (Sydney) NSW 2217, Australia, 61(2)9350 2827, Fax: 62(2)9350 3967, murrell.g@ori.org.au

INTRODUCTION
Shoulder instability can be difficult to detect. This pathologic condition manifests as pain or apprehension associated with excessive translation of the humeral head within the glenoid cavity during active shoulder motion. We carried out a prospective study to determine which, if any, of the 23 shoulder tests routinely used in our clinical examination were diagnostically reliable for predicting shoulder instability.

METHODS

The criteria for inclusion in this study were twofold: 1) the subjects had a history consistent with or suspicious for shoulder instability; and 2) the subjects had a shoulder disorder significant enough for them to be offered an examination under anaesthesia and arthroscopy.

Prior to arthroscopy, the affected shoulder was systematically examined in the clinic with 23 tests. This examination included visual assessment for range of motion (measured passively), for wasting, and for tenderness. Supraspinatus strength, subscapularis strength, and strength in external rotation and during internal rotation were assessed with manual muscle tests. Signs associated with shoulder pathology (impingement, drop arm sign, O'Brien's sign, and the sulcus sign) were also evaluated. The sulcus sign was scored as positive if the arm could be pulled down at least 2 cm, causing a dimple to appear in the skin overlying the subacromial sulcus. The examination also included three load-and-shift tests in the anterior, posterior, and inferior directions. For these, a modification (McFarland et al., 1996) was used of Hawkins and Bokor's (1990) grading system (Fig. 1). A grade of "2" indicated that the humeral head could be shifted over the glenoid rim but would spontaneously relocate or reduce whereas a grade of "3" indicated the same movement but without spontaneous reduction.

Fig. 1. Position of the humeral head within the glenoid cavity in the grading of load-and-shift tests

The affected shoulder was also examined for instability while the subject was anaesthetised for arthroscopy. The reference (gold) standard for shoulder instability consisted of one or more positive responses (with a score of "2" or greater) on load-and-shift tests administered during the examination under anaesthesia. The results of the examination under anaesthesia allowed the subjects to be classified into two groups: one group of 50 consecutive subjects with shoulder instability and the other group of 50 consecutive subjects without shoulder instability. After subjects were assigned to either of the two groups, their clinical test results were analysed using t-tests and likelihood ratios as described by Sackett et al., 1994.

RESULTS

The group with shoulder instability had significantly different results from the stable group for eleven of the 23 tests. The unstable group had a more normal range of motion than the other group of shoulder patients, both in external rotation (p<0.004) and in internal rotation (p<0.001). They had more supraspinatus strength (p<0.001) and more strength during external rotation (p=0.03). They had significantly lower scores for impingement (p=0.001 both during internal rotation and external rotation) and lower scores for the O'Brien's sign which is specific for labral pathology (p=0.03).

On the other hand, the group with shoulder instability had higher scores than the other group for the four clinical tests for instability: the three load and shift tests and the test for sulcus sign. These four tests had high specificity (98-100%); i.e., it was rare for patients with stable shoulders to have positive results for these tests in the clinic. It must be noted, however, that the clinical tests had a low sensitivity, ranging between 8 and 50%. Thus, many patients with instability would have gone undetected. Nevertheless, if a subject had a score of "2" or greater on either the test for the sulcus sign or for at least one of the load-and-shift tests in the clinic, his/her likelihood of shoulder instability was high 6:1 if exhibiting the sulcus sign, 27:1 if positive for the shift-and-load test for anterior instability, 14:1 for posterior instability, and 33:1 for inferior instability.

The examination under anaesthesia revealed that 21 of the 50 instability subjects had multidirectional instability (MDI). In the clinical examination, only 4 of these 21 subjects were identified as having MDI. Twelve of the 21 MDI subjects were assessed as having unidirectional instability and five others were found to be stable in all directions. Preoperatively, the sulcus sign was seen in 24% of the subjects with MDI.

DISCUSSION

Almost half of the subjects with unilateral shoulder instability were undetected by the load-and-shift tests and the test for the sulcus sign when carried out in the clinic. This was probably in part due to patient pain or apprehension and in part to examiner inhibition while performing the test. Regardless, due to their high specificity, the load-and-shift tests and the test for sulcus sign had some clinical usefulness because a positive finding on any one of them conferred a high likelihood that the affected shoulder had at least some degree of instability.

Examination under anaesthesia revealed that 42% of the patients with an unstable shoulder had multidirectional instability. This is consistent with the findings of McFarland et al. (1996) who examined asymptomatic athletes and found that more than 50% had shoulder joints that could be subluxated posteriorly. Only 12% of MDI cases were detected in the clinical examination.

REFERENCES

