The New Method for the Quantitative Evaluation of Infraspinatus Muscular Atrophy

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Purpose

Infraspinatus muscular atrophy is an important sign of shoulder disorder in physical examination. This atrophy is caused by suprascapular nerve palsy, rotator cuff tear and other shoulders. There are, however, a few simple objective methods for the evaluation of the degree of infraspinatus muscular atrophy disorders. We would like to suggest the ultrasonic method for the quantitative evaluation of infraspinatus muscular atrophy.

Clinical Materials

Between December 1985 and November 1986, 28 patients underwent ultrasonic evaluation for various clinical shoulder problems: suprascapular nerve palsy in 3 cases, rotator cuff tear in 12 cases and subacromial bursitis in 13 cases.

Method

The infraspinatus muscle is placed on a flat scapula and most parts of this muscle are not covered with other muscle.

We therefore tried to measure the thickness of the definite point and the area of cross section of the definite interval of infraspinatus muscle with the ultrasonic method (see fig. 1, 2, 3).

We compared the thickness and the area of infraspinatus muscle in the right side with that in the...
left side in both the rest position and dynamic external rotation of both arms (see fig. 4).

In dynamic external rotation, we evaluated the function of infraspinatus muscle as a lateral rotator.

Results

The infraspinatus muscular atrophy was obscure in inspection and palpation.

We evaluated the degree of infraspinatus muscular atrophy with the ultrasonic method.

In suprascapular nerve palsy, we observed the recovery of denervation when we repeatedly checked the degree of infraspinatus muscular atrophy by this method (see fig. 5). In the massive rotator cuff tear diagnosed by arthrography, infraspinatus muscular atrophy was observed clearly in both the rest position and dynamic external rotation of the arm (see fig. 6). In the small rotator cuff tear diagnosed by arthrography, infraspinatus muscular atrophy was only observed in the rest position, and the thickness and the area of infraspinatus muscle increased as much as the normal side in dynamic external rotation of the arm (see fig. 7). In subacromial bursitis, infraspinatus muscular atrophy was occasionally observed in the rest position and was not observed at all in dynamic external rotation (see fig. 8).

Discussion

The method for quantitative evaluation of infraspinatus muscular atrophy is rare. The check for muscular weakness is one good method for evaluation of infraspinatus muscular atrophy.

This method is a simple, non-invasive and exact procedure, but has some problems.

For example, patients with painful shoulder disease cannot be examined exactly for severe motion pain.

We therefore attempted to come up with a method for evaluation of infraspinatus muscular atrophy with the ultrasonic method.

Recently, ultrasonographic evaluation is an important diagnostic method for many kinds of disease. In the lesion of the shoulder, this method has been performed in patients with the lesion of
the rotator cuff).

Until recently, arthrography has often been performed on patients with lesion of the rotator cuff. And arthrography is quite sensitive in detecting even small tears in the rotator cuff and has been reported to be very reliable in excluding tears. However, arthrography is an invasive procedure with a small risk and a high rate of delayed morbidity.

On the other hand, the ultrasonic method is a non-invasive procedure, and the sensitivity and the specificity in detecting a tear of the rotator cuff are high.

Therefore, it is our view that ultrasonographic evaluation take the place of arthrography and be used as the initial imaging test for all patients with suspected abnormalities of the rotator cuff.

If our new ultrasonic method is performed at the same time that the previous reported ultrasonographic evaluation is carried out, the sensitivity in detecting a tear becomes higher and we can evaluate the width of a tear of rotator cuff more exactly prior to surgery.

References

Summary
We recommend the new quantitative evaluative method of the degree of infraspinatus muscular atrophy using ultrasonic diagnostic method. We think that this is a useful diagnostic method for the various shoulder disorders with infraspinatus muscular atrophy.

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