Scapular dyskinesis assessment

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Abstract

Considering the potential lack of consensus regarding appropriate measure and reduced reliability values of scapular dyskinesis visual dynamic evaluation, this protocol includes the main three classification approaches by considering the methodological improvements suggested by the original authors.

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Before start

Table 1. Original operational definitions of the classification methods of scapular dyskinesis.

4-type [1]	**Type 1**	Prominent inferior medial scapular border at rest and during arm motion
	Type 2	Prominent entire medial scapular border at rest and during arm motion
	Type 3	Elevation of the superior border and anterior displacement of the scapula at rest and shoulder shrug without the occurrence of significant winging of the scapula at the beginning of the movement
	Type 4	Both scapulae are positioned symmetrically (the scapula of the dominant member may be a bit lower) at rest and turn symmetrically upwards with the medial border attached to the thorax during movement.
Yes/No [2]	**Yes**	Types 1, 2, and 3: Patterns of scapular asymmetry
	No	Type 4: Symmetric scapular motion

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SDT [3]	**Obvious**	Apparent prominence of any portion of the medial border or inferior angle or dysrhythmia, or excessive or premature movement of the scapula during elevation or lowering of the arm
	Subtle	Questionable evidence of abnormality, inconsistently present
	Normal	Absence of projection of the scapula, and upper and lower rotations are smooth and continuous during elevation and lowering of the arm, respectively.

Abbreviation: SDT, scapular dyskinesis test**.**

1. Kibler WB, Uhl TL, Maddux JW, Brooks PV, Zeller B, McMullen J. Qualitative clinical evaluation of scapular dysfunction: a reliability study. J Shoulder Elb Surg. 2002;11: 550-556.
2. Uhl TL, Kibler WB, Gecewich B, Tripp BL. Evaluation of clinical assessment methods for scapular dyskinesis. Arthroscopy. 2009;25: 1240-1248.
3. McClure P, Tate AR, Kareha S, Irwin D, Zlupko E. A clinical method for identifying scapular dyskinesis, part 1: reliability. J Athl Train. 2009;44: 160-164.

Protocol

Raters training

Step 1.

The physical therapists underwent a 9-h training session divided in three days.

On the first day, the raters separately studied the original descriptions and analyzed photographs of the three SD classifications by the authors, i.e. 4-type (Kibler et al., 2002), Yes/No (Uhl et al., 2009), and scapular dyskinesis test (McClure el al., 2009).

On the second day, both raters analyzed the videos presented in the McClure et al. (2009) study, performed the assessments without knowledge of the other outcomes, and compared and discussed the differences.

On the third day, the raters independently assessed eight asymptomatic volunteers, and results were subsequently compared and discussed.

Experimental procedure

Step 2.

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During the assessment, the participants initially stood in a relaxed position with arms at the sides, elbows straight, and shoulder in neutral rotation. Subsequently, the participants were instructed to raise both arms above his or her head simultaneously as much as possible in a 2-s period, and then lower the arms for 2 s. The participants performed one series of 8–10 cycles (at least eight and maximum of ten) of elevation and lowering of the arms with weighted loads based on their body mass. Participants who weighed <68.1 kg and ≥68.1 kg used 1.5-kg and 2.5-kg dumbbells, respectively.

The raters stood approximately 2 m behind the participants with freedom to move during the test to observe the scapula from any point in the posterior frontal and sagittal planes, without performing any other evaluation, such as palpation. The raters performed the assessment simultaneously, and independently, i.e., they did not communicate their results to each other at any time, and their recordings were obscured by using a folder that covered the notes from the view of each other.

Scapular dyskinesis classification

Step 3.

First, the raters defined the scapular dyskinesis on Yes/No classification. Second, they chose the altered specific scapula movement (Type 1, 2, or 3) if SD was classified as “Yes.” Finally, the raters judged the degree of observed abnormal movements (obvious or subtle). If classified as “No,” it was classified accordingly as Type 4 and normal for scapular dyskinesis test classification. Only one rater explained the test procedures to volunteers.

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