Is the Constant score reliable in assessing patients with frozen shoulder?

60 shoulders scored 3 years after manipulation under anaesthesia

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Submitted 02-09-27. Accepted 03-07-01

ABSTRACT We assessed the function of 60 primary frozen shoulders at a mean of 33 months after manipulation under general anaesthesia. Each patient was scored according to the system described by Constant and Murley (1987). We also evaluated a modified method of strength assessment with the sling over the mid-humerus (modified Constant score), and analyzed the abbreviated Constant score, which excludes the strength measurement (Patel et al. 1999). Moreover, the patients filled out an Oxford questionnaire (Dawson et al. 1996). We found a better correlation between the Oxford score and the Constant-Murley score when muscle strength was excluded or measured by the modified method.

The Constant score has been accepted widely for evaluation of shoulder joint function. However, MacDonald et al. (1993), Conboy et al. (1996), and Patel et al. (1999) have noted a few problems in using this score to assess certain disorders and in the elderly and females. We compared the Constant score, an abbreviated Constant score and a modified Constant score to the Oxford score (questionnaire) for evaluation of shoulder function in a group of patients following manipulation of frozen shoulders under general anaesthesia.

Patients and methods

We determined the function of 60 primary frozen shoulders (29 females) following manipulation under general anaesthesia. Their mean age was 53 (33–83) years. The dominant side was affected in 18 patients, the non-dominant side in 24 and both shoulders in 9 patients, but on different occasions. The follow-up assessment was done at a mean of 33 (6–88) months after manipulation.

Each shoulder was scored using the following 4 methods:

1. Constant score as described by Constant and Murley (1987). The best score is 100 points, 25 of which concern the ability of the patient to lift 25 pounds with his arm as an assessment of muscle strength. We used the method described by Moseley (1972) and recommended by Constant and Murley (1987) to assess muscle strength.

2. Modified Constant Score. We repeated the same method as before, but with the sling over the upper arm (mid-humerus) and not at the level of the hand, as recommended by Constant and Murley (1987).

3. Abbreviated Constant Score (Patel et al. 1999). We recorded the scores, excluding the measurement of strength, with a maximum score of 75 points.

4. Oxford score. We asked the patient to fill in the Oxford questionnaire on the patient's perception of shoulder surgery (Dawson et al. 1996). The questionnaire consists of 12 questions, 5 points for each one, with the best score 12 points and the worst score 60 points.

Results

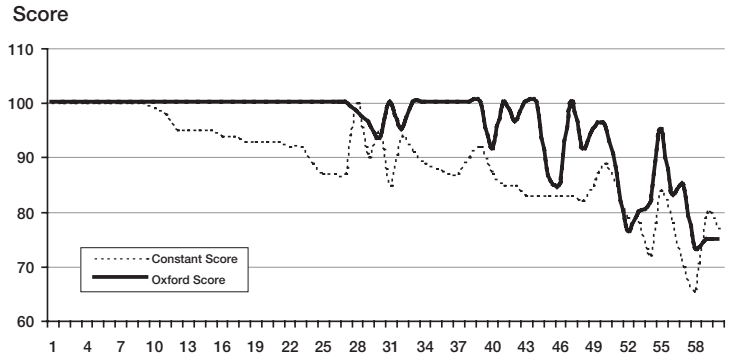
The mean score with each method is shown in

Table 1. The mean (range) scores

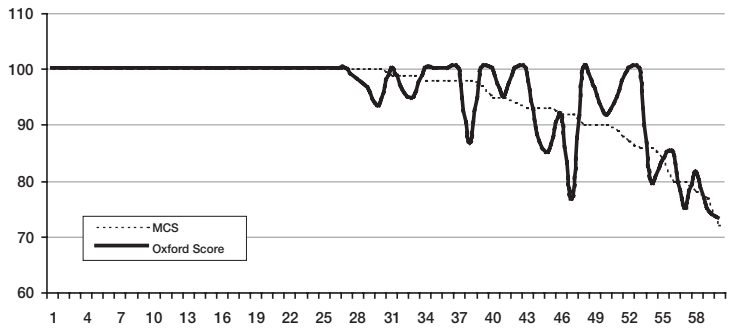
Scoring system	Score mean/best	(range)	percentage
Constant	89/100	(66–100)	89%
Modified Constant	95/100	(72–100)	95%
Abbreviated Constant	72/75	(52–75)	97%
Oxford (range 60–12)	15/12	(24–12)	96%

Table 2. No of shoulders with 65–80% (A), >80–90% (B), and >90% (C) of the best score in each scoring system

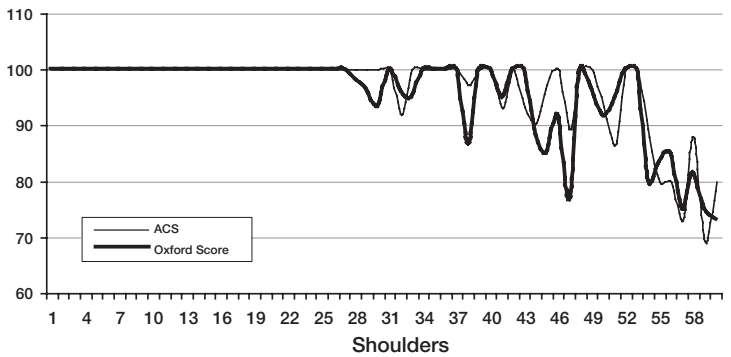
Scoring system	A	B	C
Constant score	8	24	28
Modified Constant score	4	8	48
Abbreviated Constant score	5	4	51
Oxford score	4	6	50



A comparison of the Constant and Oxford Scores expressed in percentage.



A comparison of the Modified Constant and Oxford Scores expressed in percentage.



A comparison of the Abbreviated Constant and Oxford Scores expressed in percentage.

Table 1. We found that 38 shoulders were rated as having the best Oxford score, 44 the best abbreviated Constant score and 30 shoulders the best modified Constant score, while only 9 shoulders had the best Constant score (Table 2).

We found that the best correlation was that between the Oxford score, the abbreviated Constant score and the modified Constant score (Figure). However, the Constant score correlated poorly with the three other scores. We noticed that

the elderly and female patients had difficulties with the strength test, and failed to obtain a significant number of the 25 points allocated to this test, which reduced the total score. This was true of the non-dominant shoulders as well. We asked some of these patients to try to lift the 25 pounds using the normal shoulder, but they could not obtain a normal score for strength.

Discussion

The Constant score is widely used to assess shoulder function. However, Conboy et al. (1996) and Patel et al. (1999) as well as those who devised the score have pointed out that it declines in elderly patients, in females and the non-dominant hand. Patel et al. (1999) has used the term abbreviated Constant score after excluding the strength measurement. He was uncertain about the reliability of the strength measurement for assessing his patients following subacromial arthroscopic decompression.

We found that an assessment of muscle strength of a frozen shoulder before manipulation is almost impossible, because most of the patients cannot abduct their shoulders enough to lift 25 pounds reliably.

The disadvantage of this method is that some patients with normal shoulders may lose a few points in the score solely due to their inability to lift a heavy weight. Inclusion of strength may cause a falsely low score (Table 2). An average car battery weighs about 25 pounds. Most people will agree that this is a heavy load to lift in abduction with the elbow held fully extended. For this reason, we preferred to measure muscle strength with the sling over the upper arm (mid-humerus) and not at the level of the hand, as originally recommended by Constant and Murley (1987). This method makes it easier for the patients to lift the 25 pounds by reducing the lever arm.

We found that if the weight component is excluded, there is a good agreement with the Oxford score. This was also true when we measured strength at the level of the upper arm. On the other hand, the Constant score does not correlate well with the Oxford score.

We recommend that the measurement of the outcome of alternative treatments in the management of shoulder disorders should be done using patient-based measures (e.g., Oxford score) combined with the conventional Constant score. The presentation of the Constant score readings before and after excluding the muscle strength points would help in interpreting the results, especially when the variations in the outcomes are minor.

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