

THE HUNG UP SHOULDER : ANTERIOR SUBLUXATION LOCKING IN ABDUCTION

B. KESTENS¹, M. HOOGMARTENS¹

The hung up shoulder, or anterior subluxation locking in abduction, is a bizarre clinical picture which is not frequently seen. It is probably due to the fact that, in the subluxed position, the subscapularis muscle becomes an abductor, rather than an internal rotator. External rotation might shift the subscapular muscle fibres towards the proximal aspect of the humeral head, while joint laxity favors subluxation. It is possible that the hung up shoulder is just one aspect of multidirectional shoulder instability, given the tendency to generalised joint laxity, the frequent autoreduction, the positive sulcus sign, and initiation of subluxation by either abduction-external rotation or extension. In this series three out of four patients were treated conservatively and performed well in daily life; however, only the fourth patient had almost unlimited access to sports, thanks to surgical stabilization.

Keywords : shoulder ; anterior subluxation ; locking ; hung up shoulder.

Mots-clés : épaule ; subluxation antérieure ; blocage ; épaule suspendue.

INTRODUCTION

Locking in abduction of the anteriorly subluxed shoulder is a rare entity. Blazina and Satzman (1), who coined the term "hung up shoulder" in 1969, described only 4 cases. Cowan and Shaw (4) described two cases, and gave a very likely explanation, already in 1964. In their vision a humeral head defect locked on the anterior margin of the glenoid, which was confirmed by axillary radiographs, while the subscapularis muscle acted as an abductor pulling over the humeral head as a fulcrum.

METHODS

From April 30, 1982, to June 18, 1990, we saw 4 patients, 1 woman and 3 men (Table I). All 4 patients were visited at home by the junior author (B.K.). The average age at follow-up was 37 years, range 32 to 41 years. The average duration of follow-up was 16 years, range 6 to 23 years. The patients were carefully questioned and examined. The Constant scoring system (3) was used (Table II). It has the advantage to be applicable to any shoulder condition, and to provide a full functional assessment; it has the disadvantage not to consider instability. However, scores that include instability do so only in function of operative repair, which was only performed in a single case, in this series. Abduction force was measured in pounds, at 90°, by means of a spring balance (6). Instability, rotator cuff lesions, tendinitis of the long biceps tendon, and acromioclavicular osteoarthritis were also looked for. Joint laxity was evaluated according to Carter and Wilkinson (2); a score higher than 3/5 was considered positive for generalised joint laxity.

CASE REPORTS

Case 1 : A 25-year-old clerk fell sideways on his left outstretched arm, while playing soccer, in 1980 (Table I). His left shoulder remained locked in abduction for a few minutes, after which he

¹ Department of Orthopaedic Surgery, University Hospital K.U.Leuven, Weligerveld 1, B-3212 Pellenberg, Belgium.

Correspondence and reprints : M. Hoogmartens.

Table I. — Generalities

	Case 1	Case 2	Case 3	Case 4
Age at first hung up/Sex	25y/m	18y/m	17y/f	16y/m
Number of hung ups	1	2	2	4
Total number of subluxations	31	3	11	6
Age at follow-up	41y	41y	35y	32y
Both abduction-exorotation and extension causative	+	—	+	+
Autoreduction	always	exc. 1x	exc. 1x	always
Gerber test	anterior +	—	—	—
Apprehension	anterior	anterior	anterior	anterior
Sulcus sign	+	+	+	+
Joint laxity	3/5	3/5	3/5	4/5

was able to reduce it with a slight push from anteriorly. In the following 16 years he sustained about 30 more subluxations, but progressively less and less, and without locking, always as a consequence of abduction - external rotation or extension. This seemed to plead for anterior and posterior subluxations. Reduction was always accomplished by the patient himself. An examination under anesthesia had been proposed but was not accepted. Weakness and instability were the main complaints at follow-up, at age 41, and made practice of sports impossible. A "dead arm" was never noted.

Physical examination led to a Constant score of 77/100 points (3) (Table II). Moreover, a positive sulcus sign, distinct anterior instability and apprehension, cuff degeneration and some acromioclavicular osteoarthritis were observed. The patient fell just short of joint laxity, according to the evaluation system of Carter and Wilkinson (3), with a 3/5 score.

Radiographs were never made with the shoulder in the subluxed position, as the shoulder was always reduced within minutes. At first examination in the university hospital, in 1986, plain radiographs showed a small bony avulsion at the inferior border of the glenoid. This was in favor of anterior subluxation, but the subjective feeling

of the patient and the sulcus sign argued for a multidirectional instability.

Case 2: An 18-year-old student had his first "hung up shoulder" in 1973, while playing volleyball, after a sudden abduction-external rotation smash movement with his right arm (Table I). He too could reduce the subluxation, after a few minutes, with a gentle thrust from anteriorly. Exercises were only started at age 21, after a second subluxation, but without "hung up" locking; autoreduction was again possible. A third subluxation occurred at age 27, with a second "hung up" deformity in 60° of abduction; the patient was now seen for the first time in the university hospital, where reduction was easily obtained with traction without anesthesia, one hour later. At follow-up, at age 41, as a medical doctor, he complained of instability. Ball-games were impossible. A dead arm was never noted. A stabilizing operation had been proposed, but had been declined by the patient.

Physical examination: 87/100 points on the Constant score (Table II). The sulcus sign and the anterior apprehension test were positive, the Gerber test (5) was negative. Joint laxity score: 3/5.

Plain axillary radiographs, made at the occasion of the second "hung up" episode in 1982, showed an anterior subluxation. Control radiographs,

Table II. — Functional results according to the Constant rating score

	Case 1	Case 2	Case 3	Case 4
Absence of pain : 0 to 15	10	15	15	15
Activities of daily living :				
Work : 0 to 4	4	4	4	4
Recreation : 0 to 4	0	2	2	3
Sleep : 0 to 2	2	2	1	1
Level of positioning : 2 to 10	10	10	8	4
Range of motion :				
Abduction : 0 to 10	10	10	10	10
Flexion : 0 to 10	10	10	10	10
Int. Rotation : 0 to 10	8	10	10	10
Ext. Rotation : 0 to 10	10	10	10	6
Abduction power at 90°, in pounds : 0 to 25	13	14	6	8
Total : 100 points	77	87	76	71

made two weeks later, showed a typical Hill-Sachs lesion. Absolute arguments for a multidirectional instability were missing in this case : the subluxations were probably purely anterior.

Case 3 : A 17-year-old girl made a smashing movement with her left arm, while playing volleyball, in 1978 (Table I). A "hung up" shoulder, fixed in 30° of abduction, was reduced in a local hospital, one hour later, under general anesthesia, without radiographic examination. A sling was applied for three weeks, after which physiotherapy was started. More than 10 further subluxations occurred ; a second "hung up" locking took place at age 34. Autoreduction was always possible, except the very first time. The subluxations occurred in external rotation and abduction, but also in extension, respectively referring to anterior and posterior subluxation. Isometric exercises reduced the number of subluxations. The patient, at follow-up a 35-year-old bank-employee, experienced weakness and instability. Since six months she had resumed playing tennis, but at a low level. A dead arm had never occurred.

A Constant score of 76/100 was obtained (Table II). The sulcus sign and the anterior apprehension test were positive, the Gerber test (5) was negative. Some cuff degeneration was present. Joint laxity score : 3/5.

Plain radiographs, made in March 1986, suggested a Hill-Sachs lesion, which was confirmed by a CT-arthrogram, on the same day ; the arthrogram also showed an enlarged subscapular recess, all arguments for anterior subluxation. But the history was rather in favor of multidirectional instability.

Case 4 : A 16-year-old student fell backwards on his left outstretched arm, while playing soccer, in 1990 (Table I). A "hung up" shoulder was reduced by the patient himself, within a minute. In the next 12 months he had five more subluxations, three of which resulted in a "hung up" deformity. Autoreduction was always possible. Abduction-external rotation or extension were causative, pleading for anterior and posterior subluxation. Exercises gave little result and an operation was finally decided upon in a local hospital. A posterior bone block was applied. The patient, now a 32-year-old machine operator, was quite satisfied with the stability provided by the posterior bone block. He experienced limitation of external rotation, and weakness when working above shoulder level. Soccer and even karate were his favorite sports.

At physical examination a Constant score of 71/100 was noted (Table II). This was probably due to the fact that this score does not take

stability into consideration. Moreover, some tendinitis of the long biceps tendon and some rotator cuff degeneration became apparent; the sulcus sign and the anterior apprehension test were positive, the Gerber test (5) was negative. This patient was the only one to reach a significant 4/5 joint laxity score (2).

Plain radiographs, obtained in July 1990, before the operation, demonstrated a loose bone fragment at the distal pole of the glenoid, suggestive for a Bankart lesion, and a Hill-Sachs lesion. An arthro-CT on the same day showed flattening and rupture of the anterior labrum, but also flattening of the posterior labrum; the Hill-Sachs lesion was confirmed. Moreover, a capsular insertion type 2-3 was made visible. The radiographic examination as well as the history gave arguments for a multidirectional instability.

DISCUSSION

According to the literature (4) and to our own data, locking of the "hung up" shoulder occurs in a position of 30 to 100 degrees of abduction. This might be due to the subscapularis muscle becoming an abductor in the anteriorly subluxed position, rather than an internal rotator (4). It is our opinion that this mechanism is probably enhanced by external rotation, which shifts the subscapularis fibres to the proximal aspect of the humeral head.

Joint laxity apparently is a second factor: in our study three cases just fell short of being hypermobile, while the fourth one was hypermobile, according to the Carter-Wilkinson score (2). Connected with hypermobility is the fact that in all cases arguments for multidirectional instability were found. However, the "hung up" locking was probably correlated with anterior rather than with posterior subluxation, as posterior subluxation does not occur with abduction.

Sports seem to constitute a third facilitating factor: all our and Cowan's cases (4) were initially provoked by contact sports.

All but two "hung up" shoulders were reduced by the patients themselves. The exercises that were prescribed afterwards seemed to have some effect,

as three out of 4 patients did not opt for surgery. But in fact only the single surgically treated shoulder became really stable, exactly like Cowan's two cases (4). Of course, in all conservatively treated patients problems were minor as far as the activities of daily living were concerned, but sports were definitely limited.

All four patients spontaneously stipulated that their shoulder dictated what to do or not to do. It will be interesting to find out if increasing age, and thus decreasing laxity, will improve their condition.

One can state that hung up shoulder probably is just another presentation of multidirectional shoulder instability. Arguments are: the tendency to generalised joint laxity, the ease of autoreduction in most subluxations, the positive sulcus sign in all 4 cases, and abduction-external rotation as well as extension as a causative factor.

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SAMENVATTING

B. KESTENS, M. HOOGMARTENS. De opgehangen schouder: ventrale subluxatie gefixeerd in abductie.

De auteurs beschrijven vier gevallen, allen opgetreden bij sportbeoefening. Waarschijnlijk wordt de m. subscapularis in plaats van een inwendige rotator een abductor, wat de fixatie in abductie verklaart. Exorotatie kan mogelijk dit verschijnsel in de hand werken

doordat de vezels van m. subscapularis naar proximaal verschuiven. Ook hypermobiliteit en sport spelen waarschijnlijk een rol. Het is mogelijk dat hung up shoulder gewoon een onderdeel is van multidirectionele schouderinstabiliteit, gezien de neiging tot veralgemeende laksheid der gewrichten, de frequente autoreductie, het positieve sulcus sign, en — als uitlokkende factor voor de subluxaties — zowel abductie-exorotatie als extensie. Een conservatieve houding waarborgde een bijna normaal dagelijks leven (drie gevallen), operatieve stabilisatie liet sport toe op niveau (één geval).

RÉSUMÉ

B. KESTENS, M. HOOGMARTENS. L'épaule suspendue : subluxation antérieure fixée en abduction.

Les auteurs rapportent quatre cas, tous survenus au cours d'un effort sportif. Le muscle sous-scapulaire

devient probablement un abducteur, plutôt qu'un rotateur interne, ce qui explique le blocage en abduction. La rotation externe pourrait favoriser le phénomène, en déplaçant les fibres du sous-scapulaire vers le haut. Une hyperlaxité ligamentaire et une attitude sportive peuvent aussi jouer un rôle. Il est possible que l'épaule suspendue soit tout simplement un aspect de l'instabilité multidirectionnelle de l'épaule, étant donné la tendance à la laxité généralisée des articulations, la fréquence de l'autoréduction, le «sulcus sign» positif, et — comme agent provocateur pour les subluxations — l'abduction-exorotation aussi bien que l'extension. Le traitement conservateur permettait une vie presque normale (trois cas), la stabilisation chirurgicale permettait en plus des performances sportives à un certain niveau (un cas).