Early complications after anterior dislocation of the shoulder in patients over 40 years

An ultrasonographic and electromyographic study

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The rate of complications after anterior dislocation of the shoulder was evaluated in 65 patients aged over 40 years. 36 of 55 cases had electromyographically verified axillary nerve or brachial plexus injury. Rotator-cuff lesion was seen in 24 of the 63 sonographically examined cases. At follow-up in a telephone interview on average 3 years after the injury, 27 of the 57 cases had complaints from their shoulder. The incidence of initial nerve and/or cuff lesions was higher in those with persisting symptoms at follow-up.

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Anterior dislocation of the shoulder may cause damage to the bone, tendons, nerves and blood vessels around the joint. Axillary nerve lesions after shoulder dislocation are well-known, but also other nerves or the brachial plexus may be damaged (Blom and Dahlbäck 1970, Liveson 1984, Travlos et al. 1990). Rupture of the rotator cuff occurs predominantly in older patients (Neviaser et al. 1988). The rates of occurrence of cuff and nerve lesions in older patients who have an anterior dislocation of the shoulder are, however, poorly described in the literature.

We report complications of shoulder dislocation in patients over 40.

Patients and methods

A prospective study of 65 patients (36 men and 29 women) with a mean age of 64 (41–90) years with anterior dislocation of the shoulder was performed. 6 patients had a previous history of shoulder dislocation but none of these had had surgery. The dislocation was verified by radiography. Cases with associated tuberosity fracture were excluded. The right side was affected in 39 and the left in 26 cases. 6 patients had complaints from the non-injured shoulder and 2 of these had a history of anterior dislocation.

Initially a closed reduction was done and the arm was immobilized in a sling. Physiotherapy and exercises began 2–3 weeks after the injury.

Electromyographic examination (EMG) was performed 6 weeks after the injury on a four-channel Medelec MS 6 electromyograph, using concentric needle electrodes. The deltoid and supraspinatus muscles were examined in 55 patients. In 30 patients one or several additional muscles innervated by the musculocutaneous, radial, median and ulnar nerves were examined on clinical suspicion of additional neurological lesions. Proofs of denervation were spontaneous activity (fibrillations and/or positive sharp waves) during relaxation, increased amount of polyphasic motor unit potentials (MUPs) during slight contraction, and reduction of MUPs during maximal contraction. Denervation was classified: Grade 1 slight reduction of MUPs, Grade 2 moderate reduction, Grade 3 pronounced reduction, and Grade 4 total denervation.

Real-time ultrasonography was performed with an Acuson 128, Mountain View C A, using a 5 MHz linear transducer. The examination was done in 63 patients, 1 month after the injury. Both shoulders were examined, using the non-dislocated shoulder as a control. The rotator cuff was examined dynamically by moving the shoulder in different directions according to the natural direction of each muscle and tendon (Collins et al. 1987).

In total ruptures it was not possible to identify the examined tendon, and the humeral head was close to the deltoid muscle. In partial ruptures there was a partial thinning or irregularity of the affected tendon. All the cases with disabling symptoms and sonographically diagnosed total rupture of the rotator cuff were

Table 1. Observations in 65 patients with anterior dislocation of the shoulder

A	B	C	D	E	F	G	H
1	70	2	1	1	2	0	1,2,4,5,6,7
2	67	2	1	0	1	0	0
3	71	2	1	1	1	0	0
4	84	2	1	0	1	0	0
5	84	2	0	0	1	0	0
6	54	2	2	0	1	–	–
7	68	2	1	1	1	0	0
8	49	1	3	0	1	13	0
9	59	2	3	1	1	4	2,3,4,5,6
10	60	1	1	0	2	0	1,2
11	72	1	2	1	3	0	0
12	74	1	4	0	1	0	0
13	49	1	2	0	1	4	1,7,8
14	71	1	3	1	1	0	0
15	43	1	5	2	2	26	1,7
16	83	2	0	0	3	–	–
17	73	1	0	0	3	–	–
18	42	1	0	0	1	1	0
19	53	1	0	0	1	52	0
20	53	1	1	1	2	20	1,2,3,4,5,8,9
21	73	2	3	0	1	0	0
22	68	1	5	0	3	0	3,5,6
23	49	1	0	0	1	2	1,3,4,5,6,7
24	46	2	3	0	1	2	1,2,4
25	59	2	3	2	1	0	1,2,3,5,6,7
26	56	2	2	1	1	30	3,4,7,8
27	68	1	3	1	1	0	1,2,3,7,8
28	74	2	0	0	2	0	0
29	76	1	3	1	1	0	1,3
30	65	2	1	0	1	0	0
31	90	2	0	0	2	–	–
32	65	1	3	2	1	–	–
33	42	1	3	0	1	4	1
34	65	2	1	0	3	0	1,4,6,9
35	66	1	3	1	2	0	1,4
36	56	1	3	0	1	7	3
37	57	1	3	0	2	2	0
38	41	2	1	0	1	10	1,2,3,4,5,7,8
39	49	1	3	0	1	52	1
40	70	2	3	0	3	0	0
41	42	1	0	0	1	12	1,3,4,7
42	66	2	3	1	3	0	1,2,3,4,6,7,8
43	85	1	1	0	1	0	0
44	48	1	3	0	1	3	0
45	81	2	1	1	1	0	–
46	71	1	4	1	3	0	0
47	68	1	2	1	1	0	0
48	54	2	2	1	3	5	3,4,5,6,9
49	70	1	1	1	1	–	–
50	68	2	4	1	1	0	0
51	54	2	1	0	1	26	1,2,3,5,6,7
52	80	1	1	1	3	0	3,9
53	60	1	2	1	3	20	0
54	67	1	2	1	1	0	0
55	60	2	4	1	2	8	1,2,3,4,5,9
56	65	1	0	0	3	0	1,3,5,6
57	75	1	4	2	1	0	2,6,7
58	66	1	4	2	2	0	0
59	77	2	4	1	0	0	0
60	50	1	1	0	1	0	0
61	56	2	1	1	1	5	0
62	73	1	1	2	2	0	–
63	68	1	0	0	0	0	0
64	67	2	3	0	1	0	0
65	74	2	1	0	2	0	0

A Case
B Age
C Sex
- 1 Male
- 2 Female

D EMG findings N. axillaris
- 0 Not performed
- 1 Normal
- 2 Slight denervation
- 3 Moderate denervation
- 4 Pronounced denervation
- 5 Total denervation

E EMG findings plexus brachialis
- 0 Not performed
- 1 Normal
- 2 Pathologic

F Ultrasound findings
- 0 Not performed
- 1 Normal
- 2 Partial rupture
- 3 Total rupture

G Sick-leave period in weeks

H Symptoms at follow-up
- 0 No complaint
- 1 Pain on movement of the shoulder
- 2 Pain at rest
- 3 Restricted shoulder mobility
- 4 Feeling of instability
- 5 Weakness of shoulder
- 6 Weakness of hand
- 7 Numbness of hand
- 8 Numbness of shoulder
- 9 Redislocation

offered surgical treatment.

At follow-up after a mean of 38 (20–54) months after the injury, a telephone interview of 57 cases was possible; 5 patients had died and 3 were lost. A detailed questionnaire was used.

Statistical analysis was performed by the Chi-square test. The level of significance was set at $P < 0.05$.

Results

EMG showed signs of one or several nerve lesions in 36 of the 55 patients examined. The axillary nerve was the most commonly affected, as 35 patients had denervation of the deltoid muscle: in 8 patients the denervation was slight, in 18 moderate, in 7 pronounced, and in 2 patients there was total denervation. 1 patient without a lesion of the axillary nerve had pronounced denervation of muscles innervated by the radial nerve and slight denervation of median and ulnar nerve muscles. 5 patients with an axillary nerve lesion had one or several additional nerve lesions. 4 patients had lesions of 2–4 arm nerves and 2 of these had also a suprascapular nerve lesion.

Sonography revealed a lesion of the rotator cuff in 24/63 cases. These were classified as partial ruptures in 12 and total in 12 cases. Simultaneous cuff and nerve lesions were present in 13 cases.

At follow-up 30 patients reported normal shoulder function and had no complaints, whereas 27 had persisting symptoms (Table 1). In the latter group 23 had had cuff and/or nerve lesions as compared to 18 in the asymptomatic group ($P < 0.05$). 6 of the 12 cases with sonographically verified partial cuff lesion had persisting symptoms while 4 were asymptomatic and 2 were lost to follow-up. 6 of the 12 cases with total ruptures were symptomatic. 2 cases were treated surgically with rotator cuff repair within 3 months. 2 had died and 4 of the cases were without symptoms. 1 of the operated patients had no complaints at follow-up while the other had persisting symptoms. 14 of the 27 cases with moderate-to-total axillary nerve lesion were symptomatic at follow-up as were 3 of the 6 cases with plexus injury. 2 patients with plexus injury were lost. 6 of the 13 cases with combined nerve and cuff lesions had persisting symptoms. 1 of these cases was lost.

Discussion

The overall incidence of complications after shoulder dislocation in the present material of patients over 40 years of age was higher than earlier reported; 75 percent had nerve and/or rotator cuff lesions verified by EMG and ultrasonography. Pasila et al. (1978) recorded 32 percent complications in the same age group. However, their findings were based on clinical examination only. Nerve lesions were more frequent in our series, as compared to the study of Blom and Dahlbäck (1970), who, in 73 patients with shoulder dislocation and fracture of the neck of humerus, found that 31 percent had nerve lesions. The difference might be explained by their inclusion of patients with fractures, their exclusion of cases with slight denervation, and by the fact that the ages of their patients were not given. Contrary to the results of 8 percent axillary nerve injuries in patients with shoulder dislocation and rotator cuff ruptures (Neviaser et al. 1988), about half of our patients with cuff lesions had axillary nerve lesions. According to previous findings most of the cases with axillary nerve palsy recover spontaneously after 3–12 months (Berry and Bril 1982). However, when no re-innervation occurs within 4 months, surgery with nerve graft has been proposed (Berry and Bril 1982, Travlos 1990), but was not done in this study. Ultrasonography, properly performed, is useful and reliable in the diagnosis of cuff tears (Mack et al. 1988, Nelson et al. 1991). Our rate of sonographically diagnosed cuff lesions was 40 percent, whereas a rate of 57 percent was found by an arthrography study (Reeves 1969). Most of these patients were more than 50 years old. In patients over 40 years of age, physical examination suggested a rotator cuff tear in 90 percent of the cases (Hawkins et al. 1986).

However, physical examination is probably less reliable than ultrasound and arthrography. Contrary to the low rate of symptomless patients with cuff tears reported by Hawkins et al. (1986), we found that one-third of sonographically diagnosed cuff tears had no symptoms at follow-up. Almost half of our patients were symptomatic 3 years after the injury. After an average follow-up period of 32 months, Hawkins et al. (1986) reported that 30 of 39 patients were still symptomatic, almost all with clinical signs of a cuff tear.

In conclusion, anterior dislocation of the shoulder in patients over 40 years of age is often accompanied by nerve and rotator cuff lesions and these patients should be followed closely during the first weeks after the injury. Inability or weakness to abduct the arm should result in further examinations in order to detect and, perhaps, treat such complications as early as possible.

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