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EARLY COMPLICATIONS OF PRIMARY SHOULDER DISLOCATIONS

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A prospective study of the complications of primary shoulder dislocation was carried out for the 3-year period 1973–1976.

The clinical examination was made initially in the Casualty Department and the patient was re-examined in the Department of Physical Medicine. In the evaluation special attention was given to the condition of the rotator cuff, the blood vessels and the motor and sensory function of the affected extremity.

Sixty-three out of 238 patients (26 per cent) presented with the following complications: 29 lesions of the brachial plexus, 21 of the axillary nerve and 28 ruptures of the rotator cuff tendon. Complications occurred more frequently in the age group over 50 years ($P < 0.001$) and in manual labourers compared with office workers ($P < 0.05$). If the humerus remained unreduced for more than 12 hours, the frequency of complications increased ($P < 0.01$).

Key words: humerus; shoulder dislocation; tendon injuries; nerve injuries

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The humeroscapular joint is the joint which most often dislocates. Although the dislocation is common, little in known of the rate of complications. Whenever there are difficulties with mobilization of the shoulder joint after the primary immobilization, one or other complication is usually responsible.

Reeves (1969) verified by arthrography 27 capsular ruptures in 47 shoulder dislocations. Most of the patients with ruptures were over 50 years of age. Ludin et al. (1975) arthrographied 12 dislocations with peripheral nerve lesions verifying four incomplete and four complete ruptures of the rotator cuff tendon. London (1971) established the difficulty involved in making an early clinical diagnosis of rotator cuff rupture before the patient is able to move the shoulder. He estimated the frequency of axillary nerve lesions after dislocation to be 10 per cent. Assmus & Meinel (1976) recorded 27 axillary nerve lesions after 10 dislocations and 17 other injuries of the shoulder girdle. In three of the patients the paralysis was persistent. Bouretz (1974), Ghitesco et al. (1975) and Malinski et al. (1975) all separately reported one lesion of the axillary artery in connection with reduction of shoulder dislocation. Hoffheinz (1975) reported three lesions of the axillary artery, one of which was a complication of humeral dislocation.

The purpose of this study was to analyse the early complications of primary humeral dislocation.

PATIENTS AND METHODS

This study consisted of 238 primary humeral dislocations treated during the period 1.9.1973 –

31.12.1976 in the Casualty Department, Clinic of Orthopaedics and Traumatology, University Central Hospital, Helsinki, Finland. The study consisted of 133 men and 105 women.

Before reduction a routine neurological examination was performed and the radial artery of the affected extremity palpated. Often the luxation was radiologically verified.

When the diagnosis was made 5 mg of diazepam was injected intramuscularly. Usually the patient was placed prone on a couch with the affected extremity hanging free over the side of the couch. The position of the shoulder joint was adjusted with the help of cushions until a painless hanging position of the extremity was found. After about 10 minutes the relaxation of muscles around the shoulder joint was checked by the surgeon and by using painless rotatory movement with the hanging humerus the reduction of the shoulder joint was completed. Sometimes an additional intravenous injection of 5–10 mg of diazepam was needed and in this way 88.5 per cent of the dislocations were reduced without general anaesthesia.

After reduction the shoulder joint was examined radiologically. (Patients with fractures visible on routine X-ray projections were not included in this study.) The patient was then transferred to the Physical Medicine Department where the status of the shoulder joint and the neurological signs of the affected extremity were checked by the same person. After 3 weeks the shoulder joint was examined for ruptures of the rotator cuff tendon according to a scheme published in a previous study (Pasila 1965). Furthermore the deep brachial veins were palpated to exclude deep venous thrombosis.

Strength measurements were used to diagnose nerve and tendon lesions of the affected shoulder using the unaffected shoulder for comparison. Arthrography was seldom necessary. When a severely degenerated rotator cuff tendon (with connection between joint cavity and subacromial bursa) did not give rise to the clinical picture of rotator cuff rupture, the rupture diagnosis was omitted.

The results were analysed and tested by t– and chi-square tests.

RESULTS

Sixty-three out of 238 patients (26 per cent) had some kind of complication (34 men and 29 women) (Table 1). The complications were divided into nerve lesions and rotator cuff ruptures.

The neurological complications consisted of brachial plexus and axillary nerve lesions but no lesions of the suprascapular or long thoracic nerves were observed. Most complications occurred in patients over 50 years of age ($P < 0.001$). Rotator cuff ruptures were only found in patients over 50 (Table 2).

The dislocation was most common in manual labourers; the difference between manual labourers and office workers as regards complications was almost significant ($P < 0.05$). Pensioners had the highest rate of complications (Table 3).

The trauma mechanism was known in 149 dislocations, uncertain in 86 dislocations and not known in three cases. It was possible however, to partially reconstruct the mechanism of trauma in the 86 uncertain cases. Patients who had fallen from a height

Table 1. Complications in the different age groups

Age (years)	Complications		
	Female	Male	Complication/Dislocation (%)
11–20	0	2	11
21–30	2	3	11
31–40	0	2	6
41–50	0	2	13
51–60	6	8	30
61–70	12	16	50
71–80	8	1	43
81–90	1	0	25
Total	29	34	26

Table 2. Types of complications in the different age groups

Age (years)	Plexus lesion	Axillary nerve lesion	Rotator cuff rupture	Number of patients
11–20	0	2	0	2
21–30	3	2	0	5
31–40	2	0	0	2
41–50	1	2	0	2
51–60	8	5	5	14
61–70	14	4	17	28
71–80	1	5	6	9
81–90	0	1	0	1
Total	29	21	28	63

Table 3. Complications in the various social groups

Social group	Complications	Dislocations	Complication/Dislocation (%)
Student	2	14	14
Manual labourer	24	101	24
Office worker	4	48	8
Pensioner	33	74	45
Total	63	237	26

Table 4. Effect of the mechanism of trauma on the complications

Trauma mechanism	Complications	Dislocations	Complication/Dislocation (%)
Fall	22	96	23
Fall from a height	7	16	44
Twist	10	37	27
Total	39	149	26

Table 5. Effect of the "nonreduced period" on complications

"Nonreduced period" (hours)	Complications			Complication/Dislocation (%)
	Nerve lesion	Rotator cuff rupture	Total	
< 1	16	10	24	27
1–3	16	5	15	17
3–6	6	7	10	33
6–12	3	0	3	23
12–24	4	5	7	50
> 24	5	1	4	80
Total	50	28	63	26

had the highest rate of complications (Table 4).

More than half of the dislocations were reduced within 3 hours of the accident. The rate of complications increased ($P < 0.01$) if the shoulder was unreduced for longer than 12 hours (Table 5).

No deep venous thromboses in the axillary region were found. The reduction of the shoulder joint did not seem to cause additional complications.

DISCUSSION

In arthrotic shoulders in patients over 50 years of age it is possible with or without arthrography to find clinically symptomless capsular ruptures (Pettersson 1942, Olsson 1953). This could be the explanation for the high frequency of capsular ruptures in Reeves' report (Reeves 1969).

London (1971) estimated the frequency of axillary nerve lesions in shoulder dislocations to be 10 per cent, corresponding to the findings in the present study. Bouretz (1974), Ghitesco et al. (1975) and Malinski et al. (1975) each found one case of axillary artery rupture after reduction of shoulder dislocation but this lesion did not exist in this study.

On the other hand four similar combined lesions (rotator cuff rupture and axillary nerve lesion) reported by Ludin et al. (1975) were observed in this study. Furthermore two uncommon combinations were observed: there were five simultaneous rotator cuff and brachial plexus lesions and six axillary nerve and brachial plexus lesions.

Reports of the occurrence of complications in the various social groups seem to be uncommon; neither were there any recent studies of the effect of the length of the "nonreduced period" on the occurrence of complications.

Complications should be suspected in older manual labourers and when the joint has been dislocated for more than 12 hours.

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