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DISPLACED PROXIMAL HUMERAL FRACTURES

A Review of 49 Patients

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It has often been stated that fractures of the neck of the humerus are best treated by simple measures such as a sling or hanging cast, and that early mobilization is essential (Moriber & Patterson 1967, Einarsson 1958).

It is the aim of this paper to demonstrate whether this is true or not where displaced proximal humeral fractures are concerned.

MATERIAL AND METHOD

The journals of patients with fracture of the neck of the humerus admitted to the Surgical Departments D, H, R, S and T, Copenhagen County Hospital, Gentofte, over a five-year period from 1966 to 1971 were studied and the patients divided into two groups:

1. 84 patients with slight displacement of the fragments admitted for other reasons (age, other lesions).
2. 63 patients with considerable displacement of the fragments, but without dislocation of the head fragment.

Only group no. 2 was reviewed. Eight patients were dead at the time of examination, which left 55 patients. Of the remaining 55 patients 49 were examined. One patient had disappeared and five patients would not appear. The percent reviewed was thus 89 per cent.

All the patients had previously answered a questionnaire regarding their complaints, and this was completed by re-examination including a clinical and radiological examination.

The journals and X-rays were studied and compared with the findings at the re-examination. The minimum follow-up time was 1½ years; maximum 7 years. Only patients above 20 years were included in the material.

RESULTS

The age and sex distribution of the patients are shown in Table 1.

The anatomical classification was made in accordance with the Neer classification (Neer 1970).

Table 1. Age and sex distribution.

Sex	No. of patients	Per cent	Average age
Male	14	29	64
Female	35	71	69

Youngest patient: 29 years.
Oldest patient: 94 years.

2 fragments: Fracture of the neck of the humerus.

3 fragments: Fracture of the neck of the humerus and avulsion of the greater tubercle.

4 fragments: Fracture of the neck, the greater tubercle, and the lesser tubercle.

No attempt was made to classify the fractures as abduction or adduction types, as this and other classifications are worthless (Neer 1970).

Table 2. Anatomical classification.

Fragmentation	No. of patients	Severity of displacement	
2 fragments	12	Slight	3
		Moderate	8
		Severe	1
3 fragments	22	Slight	1
		Moderate	13
		Severe	8
4 fragments	15	Slight	0
		Moderate	4
		Severe	11

Table 2 shows the anatomical appearance.

The results were evaluated according to the Neer criteria (Neer 1970). The maximum score is 100 units divided on the following points:

Pain ..... 35 units
Function ..... 30 units
Range in motion ..... 25 units
Anatomy ..... 10 units

Table 3. Overall results.

Neer classification	No. of patients	Per cent	Per cent
Excellent	12	25	39
Satisfactory	7	14	
Unsatisfactory	7	14	61
Failure	23	47	

Excellent: > 89 units.
Satisfactory: 80–89 units.
Unsatisfactory: 70–79 units.
Failure: < 70 units.
Maximum score: 100 units.

Table 4. Average score according to fragmentation.

Fragmentation	Average score	Lowest score	Highest score
2 fragments	75.5	43	94
3 fragments	73.1	36	97
4 fragments	63.6	30	98

Overall average score: 71.

Table 5. Treatment and results of treatment.

Treatment	No. of patients	Average score	Lowest score	Highest score
Sling	12	72	39	95
Hanging cast	21	68	41	92
Reduction	6	89	66	97
Osteosynthesis (rush)	3	71	50	98
Extirpation of the head	5	47	30	61
Plaster cast (thoraco-brachial)	2	75	74	76

The overall results are shown in Table 3.

It is worth noting that in 61 per cent of the patients the result was classified as unsatisfactory or a failure, and that nearly half the results were failures.

The average score in relation to fragmentation is shown in Table 4. As expected the score is lower in the more comminuted fractures, but

both good and bad results are obtained in the three groups as shown in the two columns to the right.

Six different methods of treatment were employed, and the results are shown in Table 5.

Table 6. Results of the five patients treated by extirpation of the head of the humerus.

Age	Sex	Fragmentation	Displacement	Score
66	female	3 fragments	moderate	36
74	female	3 fragments	severe	61
71	female	3 fragments	severe	50
50	female	4 fragments	severe	30
67	female	4 fragments	severe	60

Table 7. The patient's own opinion related to that of the surgeon.

Patient's opinion	No. of patients	Group classification				Average score
		Excellent.	Satisfac.	Unsatisf.	Failure	
Fully satisfied	19	9	5	1	4	82
Partly satisfied	22	3	2	6	11	70
Not satisfied	8	0	0	0	8	46

As we are dealing with different types of fractures with a varying degree of displacement, the figures are too small to allow a definite conclusion. Reduction under general anaesthesia, however, seems to give a good result, but the removal of the humeral head resulted in failure. This was done in five cases and the result is demonstrated in Table 6. All the results were failures with very low scores, the patients complaining of pain, loss of range of motion, and loss of stability. The fractures treated in this way differed in no way from the rest.

Necrosis of the head fragment was seen in four patients with the scores 42, 47, 50 and 62 i.e. all failures. There were no cases of pseudarthrosis.

All the patients were asked about their opinion of the result and this is shown in Table 7. Generally there is a good correlation between the patient's and the surgeon's opinion. All the dissatisfied patients fall

into the failure group. Four patients are fully satisfied in spite of being classified as failures.

Four patients had to give up their work because of the fracture, and 26 of the 49 patients examined were pensioners and many stated that they were disabled in their daily work.

DISCUSSION

The investigation showed that, contrary to the findings of other authors (Moriber & Patterson 1967), the results were not encouraging. The average score was 71, a very low figure, and almost half the results were failures. Only 25 per cent were excellent. Two and three fragment fractures were generally better than four fragment fractures. Removal of the head of the humerus was disastrous. All five patients were classified as failures.

Apart from the five patients who had the head fragment removed, only three patients underwent surgery, in all cases Rush osteosynthesis. Only one had an excellent result.

The remaining 41 patients were treated by closed methods.

Einarsson (1958) states that 80 per cent of three and four fragment fractures treated conservatively have a good result. This is in rather sharp contrast to my findings. Neer (1970) has treated a consecutive series of 117 patients with three and four fragment fractures and analyzed the result of closed reduction, open reduction and fixation, and prosthetic reconstruction. Closed reduction was found inadequate in both categories, whereas the preferred method for three fragment fractures was open reduction, and that for four fragment fractures was prosthetic replacement. In 1957 Knight & Mayne suggested prosthesis in patients with fracture-dislocations and comminuted fractures. No patients in the present series had prosthetic reconstruction, and this method is not widely accepted in this country.

The question is now, whether at least 60 per cent of the patients would not have been better off with another form of treatment. Neer's (1970) results are a lot better for three and four fragment fractures treated operatively.

This paper shows that the conservative treatment and the extirpation of the humeral head do not give satisfactory results, and a more active treatment including open reduction and fixation, and prosthetic replacement (assuming a correct selection of the patients) should be the future treatment of choice.

SUMMARY

A review of 49 patients with displaced proximal humeral fractures was carried out. The aim was to establish whether the old assertion was true that these fractures were best treated by conservative methods and that the results were good. It was found that 47 per cent were failures and 14 per cent unsatisfactory. Extirpation of the humeral head always resulted in failure. A more active treatment including open reduction or prosthetic reconstruction in severe fractures is recommended.

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