

Neer arthroplasty for humeral fracture

The Neer arthroplasty was performed in 10 patients with four-part proximal humeral fractures. The average follow-up was 2.5 years. No serious complications occurred. All but one became pain-free, but only four were classified as excellent or satisfactory. Videofluoroscopy revealed only minimal gleno-humeral movement in most cases.

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Four-part fractures account for a very small number of all proximal humeral fractures. In cases of severe comminuted fractures several types of treatment such as closed reduction and resection of the head (Svend-Hansen 1982) gave unsatisfactory results. Osteosynthesis led to a high percentage of necrosis (Sturzenegger et al. 1982, Lim et al. 1983). Only few reports have been published about the Neer hemiarthroplasty (Stableforth 1984, Marotte et al. 1978, Kraulis & Hunter 1976). We have evaluated the results of Neer arthroplasty in four-part fractures.

Patients and methods

This study combines the data of two orthopedic departments. In the period from 1977 to 1983, 10 patients with four-part fractures of the proximal humerus were treated by Neer prosthetic replacement. The indication was comminution with severe dislocation in eight younger patients and only comminution in two older patients. There were three males and seven females. The average age of the patients was 62 (40-75) years. Prosthetic replacement was performed an average of 6 (1-35) days after the trauma; eight out of ten patients were operated within 3 days after the trauma. In six cases the dominant arm was involved.

All operations were performed according to the technique described by Neer (1970b). The operations were performed by different surgeons or senior residents. In four cases the prosthesis was cemented due to discrepancy between the available stem size and the diameter of the humeral shaft.

Post-operative rehabilitation was the same as that described by Neer: during the first post-operative week the patients were mobilised with the arm in a

sling. After 1 week, assisted active exercises were started, mainly flexion and rotation. This scheme was continued for 6 weeks. Afterwards, abduction exercises were started. All patients continued supervised physiotherapy for 3-6 months.

All patients were examined by the authors. The average follow-up period was 2½ years (6-83 months).

The results were assessed according to Neer's (1970a) scoring system with a maximum of 100 points: excellent is graded above 89; satisfactory 80-89; unsatisfactory 70-79, and failure is graded below 70.

In seven cases the motion of the shoulder was studied with image-intensified fluoroscopy with videotape recording. Special attention was paid to the abduction movement in the gleno-humeral joint.

Results

Our results were excellent 1, satisfactory 3, unsatisfactory 5, failure 1. Nine patients were free of pain, and one had continuous pain, the only failure. All patients had reasonable

Table 1. Neer arthroplasty for proximal humeral fracture

A	B	C	D	E	F
01	66	F	3	37	77
02	64	F	17	83	79
03	75	F	1	74	77
04	57	M	1	40	84
05	40	M	2	22	95
06	60	F	35	15	86
07	56	M	1	14	80
08	57	F	2	12	71
09	71	F	1	10	40
10	69	F	2	6	74

A - Case number; B - Age; C - Sex; D - Days between trauma and operation; E - Months of follow-up; F - Score at follow-up.

strength in the affected arm. All were able to reach their head and buttocks. The active abduction ranged from 70° to 120°. Six of the seven females were able to take part in the activities of daily life. All men returned to their jobs.

Only minimal gleno-humeral movement was achieved, and most of the movement in the shoulder occurred in the thoracoscapular plane.

Discussion

Closed treatment of four-part proximal humeral fractures often leads to unsatisfactory results, due to pain and restriction in shoulder movement (Svend-Hansen 1982). The closed treatment of four-part fractures in the series of Leyshon (1984) was unsatisfactory in one patient and a failure in the other seven. As in our series, the factor which lowered the score was lack of movement. Osteosynthesis may give better results, especially if performed soon after the trauma and with careful exposure (Sturzenegger et al. 1982), but the operation carries the risk of necrosis of the head with subsequent pain. Prosthetic replacement (Neer 1970b, de Palma 1983) is not difficult, although special attention should be paid to some details, such as meticulous suturing of the rotator cuff and careful re-attaching of the tuberosities. Full motion is never regained, although normal daily activities can usually be practised (Stableforth 1984, Marotte et al. 1978).

In our series, six out of ten cases were classified as either unsatisfactory or failed, mainly due to stiffness. Our videofluoroscopy study showed that the arthroplasty resulted in only minimal gleno-humeral movement. In fact, the prosthesis acts more like a spacer than like an arthroplasty. Nevertheless, nine out of ten patients in the present series had no restriction in daily activities. In our opinion many patients who are included in the group of unsatisfactory results (70–79 points) because of impaired motion still have a fairly useful shoulder after prosthetic replacement.

Rehabilitation after hemi-arthroplasty can take up to 6 months, and besides intensive physiotherapy, the full cooperation of the pa-

tient is necessary. It was suggested by Bateman (1978) that, especially when the cuff is extensively damaged, postoperative immobilisation in an abduction plaster or cantilever splint for 4–6 weeks gives better results.

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