# Quality of life after primary hemiarthroplasty for femoral neck fracture

## 6-year follow-up of 185 patients

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**Totally, 185 patients with a mean age of 80 years treated by Austin-Moore cementless hemiarthroplasty for an acute femoral neck fracture were compared with age- and sex-matched nonfracture controls. There were 22 early complications, notably 7 percent dislocation and 4 percent deep infection. Later on, two acetabular protrusions and four loosenings of the prosthesis requiring admission were recorded. Mortality after the fracture was 12 percent above the control level at 3 months, 19 percent at 12 months, and 21 percent at 18 months. The 5-year mortality was about 60 percent in both patients and controls. The average loss of life in the fracture group compared with the control group was 425 days. After a mean follow-up period of 6 years, 24 of the 65 patients still alive and the 49 of the 60 controls were living in their own homes; and 28 of the patients were institutionalized in a hospital unit for chronic care. Half of the patients and most of the controls were able to move about independently.**

**We concluded that Austin-Moore hemiarthroplasty is associated with serious complications that prevent social rehabilitation and function to reach acceptable levels.**

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No consensus has been reached regarding the primary treatment of fractures of the femoral neck in the elderly. There are numerous advocates of primary osteosynthesis (Søreide et al. 1980, Holmberg et al. 1987, Nilsson et al. 1989); but especially outside Scandinavia, replacement arthroplasty, in particular for older and less fit patients, is still widely used (Lindholm et al. 1976, Beckenbaugh et al. 1977, Montgomery and Lawson 1978, Kwok and Cruess 1982, Diercks and Hollander 1985, Hansen et al. 1986, Kuokkanen et al. 1988). We adopted replacement of the femoral head with an uncemented Austin-Moore (Moore 1957) prosthesis in 1973, and have used it ever since routinely for cervical hip fractures.

We have analyzed 185 consecutive cases of femoral neck fracture treated by hemiarthroplasty, and evaluated the survival and some aspects of the health-related quality of life of the patients in relation to a control group representing a normal population.

## Material and methods

All the patients recorded on the computerized admissions register of our hospital as femoral neck fracture cases between 1982 and 1985 and treated by Austin-Moore hemiarthroplasty form the basic series. Of these 188 patients, 3 had a pathologic fracture and were therefore excluded. Accordingly, 185 patients (143 females and 42 males) remained in the final analysis (Tables 1 and 6). Most of these patients had concurrent diseases, only 24 being healthy on admission (Table 2). During the same 4-year period, 26 patients with a mean age of 58 (22–79) years had been treated with osteosynthesis according to our policy for patients under 65 years

Table 1. Mean age (*SD*) of patients with a femoral neck fracture and their controls at times of fracture, death, and follow-up

| Age | n | Patients | | n | Controls | |
|---|---|---|---|---|---|---|
| At fracture | | | | | | |
| All | 185 | 80 | *7.9* | 188 | 80 | *7.8* |
| Male | 42 | 77 | *9.3* | 42 | 77 | *9.2* |
| Female | 143 | 80 | *7.2* | 143 | 80 | *7.2* |
| At death | | | | | | |
| All | 120 | 83 | *7.3* | 125 | 86 | *5.1* |
| Male | 31 | 81 | *7.6* | 25 | 85 | *5.2* |
| Female | 89 | 83 | *7.1* | 100 | 87 | *5.0* |
| Subjects alive at follow-up | | | | | | |
| All | 65 | 83 | *8.7* | 60 | 77 | *6.0* |
| Male | 11 | 75 | *9.5* | 17 | 73 | *5.9* |
| Female | 54 | 85 | *7.5* | 43 | 79 | *5.4* |

Table 2. Concurrent diseases

| | Number of patients |
|---|---|
| Cardiovascular | 119 |
| Pulmonary | 20 |
| Metabolic (diabetes, hyperthyroidism, etc) | 40 |
| Neurologic or mental | 77 |
| Urologic (chronic urinary tract infection) | 15 |
| Gastrointestinal | 7 |
| Locomotor | 13 |
| Other concurrent fracture | 3 |
| Other (diseases of the blood, malignomas, etc) | 12 |
| None | 24 |

Table 3. Complications

| | Number of patients | |
|---|---|---|
| Myocardial infarction | 5 | (4 fatal) |
| Deep-vein thrombosis | 2 | |
| Pulmonary embolism | 1 | |
| Pneumonia | 2 | (1 fatal) |
| Bedsore | 1 | |
| Luxation of the prosthesis | 12 | |
| Deep infection | 7 | |
| Acetabular protrusion requiring admission | 2 | |
| Loosening requiring admission | 4 | |
| Fracture of the femoral shaft | 5 | |

of age. The borderline has been a sliding one, however, patients in poor general condition and with poor ambulatory capacity have been subjected to hemiarthroplasty even if they have been under 65 years old, and some patients over 65 years of age have had osteosynthesis according to the surgeon's preference. Moreover, 1 patient with arthrosis of the same hip and 2 with rheumatiod arthritis had had a total hip replacement.

Fifty percent of the patients were admitted from their own homes, 30 percent were admitted from old people's homes, and 20 percent were admitted from various institutions, e.g., psychiatric hospitals or hospitals for chronic care. Seventy-one percent were able to walk outdoors without aid, 20 percent used walking aid, and 9 percent were bedridden before they sustained their fracture.

The operative delay varied from 4 h to 32 days, the median being 1.5 days. The operations were performed through a posterolateral incision by specialists in general or orthopedic surgery (83 operations) or experienced residents (102 operations) using a standard technique. The mean operation time was 48 (20–95) min. No routine prophylactic antibiotics were used, but these were used on the surgeon's recommendation in 64 cases. No prophylaxis for deep-vein thrombosis was used in 131 patients, whereas 41 patients received acetylsalicylic acid, 4 received low-dose heparin, and 9 received anticoagulant therapy. Full weight bearing was started on the first postoperative day. The mean hospital stay was 11 (1–137) days. Five patients died before discharge, 28 were discharged to their own homes, 11 were discharged to old people's homes, and 141 were discharged to another hospital.

The age- and sex-matched control group, as representative of the average population, was selected randomly from the Finnish Population Register among people known to have been alive on the dates of the fracture and living in the same areas as the patients (Tables 1 and 6). The dates and causes of death of the patients and their controls were obtained from the same source.

The patients and controls who were alive on December 31, 1989, were sent a questionnaire concerning their place of residence, ambulation, causes leading to the impairment, and the need for locomotor aids. All the persons concerned were caught, and the returned questionnaires were checked on the telephone with the patients or the staff of the institutions in which the patients lived to ensure accuracy.

The data organization, statistical analyses, and Kaplan-Meier survival analysis were performed using the SAS statistical package (SAS, Institute Inc, 1987 version 5.18). The Student's *t*-test, the Wilcoxon rank sum test, and the chi-square test with Yeats' correction were used.

## Results

The most frequent general complication was myocardial infarction, which caused four early postoperative deaths (Table 3). Deep-vein thrombosis was a rare event; only one pulmonary embolism was recorded, and the patient recovered. Postoperative pneumonia was also rare, occurring in 2 cases, of which 1 was fatal.

The rate of luxation of the prosthesis was 6.5 percent (Table 3). Eight patients had had only one luxation, which was successfully treated by closed reduction. In 4 patients the tendency to dislocate continued, and the prosthesis had to be removed. There was 7 (3.7 percent) deep infections. Two of these patients died during the first postoperative month and 2 died during the third postoperative

Figure 1. Loosening and migration of the Austin-Moore endoprosthesis 5 years after its insertion.

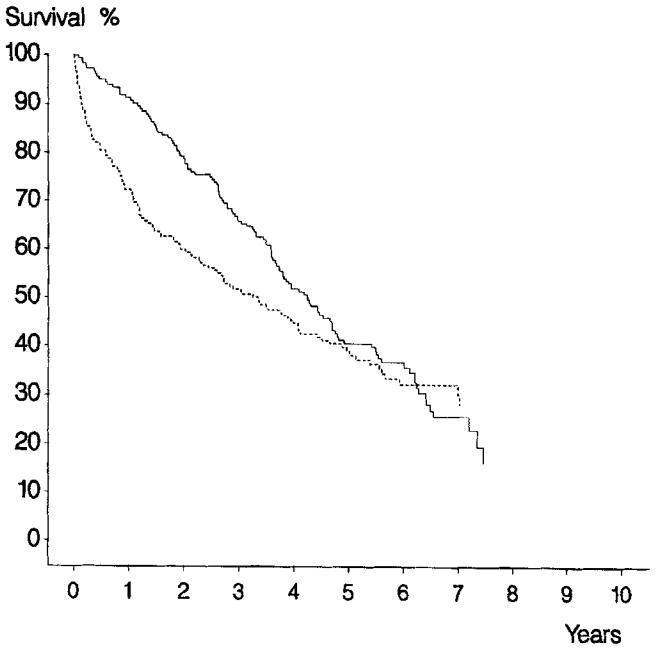


Figure 2. A Kaplan-Meier survival analysis of 185 patients with an acute femoral neck fracture treated by Austin-Moore hemiarthroplasty (----) and their age- and sex-matched controls (——).

month. Two of the remaining patients who were alive at the time of follow-up had had the prosthesis removed.

Loosening was not a major problem (Table 3, Figure 1). Only four loosenings requiring admission were recorded, of which one was subsequently treated with a total hip replacement. Two cases of acetabular protrusion requiring admission were found, 1 being treated by total hip replacement, whereas the other was managed conservatively because of the patient's advanced age. The total reoperation rate for complications associated with the prosthesis was 5 percent (9 patients). All 5 fractures of the femoral shaft (Table 3) occurred after a minor trauma. No intraoperative fractures were encountered.

Kaplan-Meier survival analysis showed completely different patterns in the patients and controls ($P$ = 0.003; Figure 2). The survival rate decreased more rapidly in the patients initially, but after 1.5 years, the rates became gradually closer, and at about 5 years, they were of about the same magnitude. This indicates that the mortality was higher in the controls than in the patients from about 18 months after the fracture onwards. The cumulative mortality was higher in the patients from 1 month to 3.5 years (Table 4), the difference in mortality between the groups being highest (21 percent) at 18 months.

The females showed similar survival patterns to those in the total material, but the differences between patients and controls were smaller ($P$ < 0.05). The survival rate among the male patients, on the other hand, decreased more rapidly and more markedly than among the controls ($P$ < 0.006) or among the female patients ($P$ < 0.05).

A higher mortality rate was recorded among patients admitted from institutions than among those admitted from their own homes ($P$ < 0.01). At 3 months, the respective cumulative mortalities were 21 and 9, and at 1 year 33 and 22 percent. At 5 years after fracture, 71 percent of the patients admitted from institutions had died as compared with only 51 percent of the patients admitted from their own homes.

After the fracture, the patients lived a significantly shorter period than did the controls, so that femoral neck fracture can be said, on an average, to have caused a loss of 425 ± 791 (Mean ± SD) days of life (462 ± 689 for males and 413 ± 826 for females). There were no differences in the causes of death between the patients and the controls. The

**Table 4. Cumulative mortality (percentage) in patients and controls at different points in time. Mean estimate *SEM***

| Time (months) | Patients | | Controls | | Difference | *P*-value |
|---|---|---|---|---|---|---|
| 1 | 6.5 | *1.8* | 0.5 | *0.5* | 6.0 | < 0.01 |
| 3 | 15 | *2.6* | 2.7 | *1.2* | 12 | < 0.001 |
| 6 | 20 | *2.9* | 4.9 | *1.6* | 15 | < 0.001 |
| 12 | 28 | *3.3* | 9.2 | *2.1* | 19 | < 0.001 |
| 18 | 36 | *3.6* | 15 | *2.6* | 21 | < 0.001 |
| 24 | 40 | *4.0* | 21 | *3.0* | 19 | < 0.001 |
| 30 | 44 | *3.6* | 25 | *3.2* | 19 | < 0.001 |
| 36 | 48 | *3.7* | 34 | *3.5* | 14 | < 0.01 |
| 42 | 52 | *3.6* | 39 | *3.5* | 13 | < 0.01 |
| 48 | 55 | *3.7* | 48 | *3.7* | 7.0 | NS |
| 60 | 61 | *3.7* | 59 | *3.7* | 1.7 | NS |

**Table 5. Place of residence, ambulatory capacity, and use of walking aids of and by the subjects alive at follow-up**

| | Patients (n 65) | | Controls (n 60) | |
|---|---|---|---|---|
| | n | % | n | % |
| Habitat | | | | |
| Own home | 24 | 37 | 49 | 82 |
| Service appartment | 2 | 3 | 3 | 5 |
| Old people's home | 11 | 17 | 3 | 5 |
| Hospital | 28 | 43 | 5 | 8 |
| Ambulatory capacity | | | | |
| Could walk alone outdoors | 6 | 9 | 33 | 55 |
| Could walk alone indoors | 25 | 38 | 20 | 33 |
| Could walk only supported by another person | 7 | 11 | 1 | 1.5 |
| Used a wheelchair | 7 | 11 | 5 | 8 |
| Bedridden | 20 | 31 | 1 | 1.5 |
| Walking aids | | | | |
| None | 7 | 11 | 43 | 73 |
| Stick | 16 | 25 | 6 | 10 |
| Crutches | 1 | 1 | 1 | 1.5 |
| Walking frame | 12 | 18 | 4 | 7 |

proportion of the control subjects dying of a malignant disease was slightly, but not significantly, greater than that of the patients (18 percent versus 10 percent).

Sixty-five patients and 60 of the control subjects were alive at the time of follow-up on an average 6 (4–8) years after the fracture. They were living under significantly different circumstances ($P < 0.001$). Forty-nine of the controls were living at home as compared with 24 of the patients, and 28 of the patients were institutionalized in a hospital unit (Table 5). Forty of the surviving patients had been admitted from independent living and 60 percent of these had been living in their own homes at the follow-up. More of the controls managed to live alone (37 percent) than did the patients (15 percent; $P < 0.01$).

Only 6 of the patients were able to walk freely outdoors, but 33 of the controls could ($P < 0.001$; Table 5). Correspondingly, only 7 of the patients and 43 of the controls managed to walk without aid ($P < 0.001$; Table 5). The fracture was regarded as the cause of the restriction in ambulation by 40 percent of the patients.

## Discussion

The insertion of a prosthesis offsets the main complications of osteosynthesis: redisplacement, avascular necrosis of the femoral head, and nonunion. However, hemiarthroplasty is accompanied by other, and equally severe complications: dislocation, infection, loosening, and acetabular protrusion. Beckenbaugh et al. (1977) and Tonino (1982) had no dislocations, Suman (1980) had 2.4 percent, Kwok and Cruess (1982) had 5.3 percent, and Stewart (1984) had 8 percent. Our 6.5 percent rate of dislocation lies at the upper end of this range. This is partly explained by the use of the posterior approach, which carries an increased risk of dislocation (Chan and Hoskinson, 1975, Montgomery and Lawson 1978). Loosening, on the other hand, was rare even with this cementless prosthesis with its old-fashioned stem designed for press fit. Also acetabular protrusion was rare. These complications caused only two total hip replacements. It must be emphasized that the rates of loosening and acetabular protrusion were the minimum values, for only those requiring admission were recorded. No radiographic survey was performed, leaving complications among bedridden and dead patients undetected. The deep infection rate of 3.7 percent in the present series was considerably higher than in recent series with internal fixation (Holmberg et al. 1987, Strömquist et al. 1987), although it was comparable to percentages reported for other Austin-Moore endoprosthesis series: 5 percent (Riska 1971, Jensen and Holstein 1975) and 3 percent (Lindholm et al. 1976). The reoperation rate was relatively low, and markedly lower than that recorded with osteosynthesis (Holmberg et al. 1987).

The control group represented an average sample of the population in the area from which the patients

**Table 6. Observations in 185 patients operated on for a femoral neck fracture by Austin-Moore hemiarthroplasty and in their age- and sex-matched controls**

| ID | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 93 | 1 | 2 | 1 | 9 | . | . | . | . | 1 | 1 | 1 | 75 | 8 | 3 | . | . | . | . | . | . | . | 119 | 6 |
| 2 | 1 | 89 | 1 | 1 | 1 | 1 | . | . | . | . | 0 | . | 1 | 40 | 5 | 3 | . | . | . | . | . | . | . | 426 | 5 |
| 3 | 1 | 90 | 2 | 3 | 2 | 1 | 5 | . | . | . | 0 | 1 | 1 | 45 | 5 | 3 | . | . | . | . | . | . | . | 82 | 3 |
| 4 | 1 | 90 | 2 | 3 | 1 | 5 | 6 | . | . | . | 0 | 1 | 2 | 30 | 3 | 3 | . | . | . | . | . | . | . | 423 | 7 |
| 5 | 1 | 87 | 2 | 2 | 2 | 1 | 3 | 5 | . | . | 0 | . | 1 | 40 | 14 | 3 | . | . | . | . | . | . | . | 993 | 3 |
| 6 | 1 | 88 | 1 | 3 | 1 | 1 | . | . | . | . | 0 | 1 | 1 | 20 | 2 | 3 | . | . | . | . | . | . | . | 389 | 2 |
| 7 | 1 | 87 | 1 | 2 | 1 | 5 | . | . | . | . | 0 | . | 1 | 60 | 11 | 3 | . | . | . | . | . | . | . | 704 | 3 |
| 8 | 1 | 85 | 2 | 1 | 1 | 1 | 5 | . | . | . | 0 | . | 2 | 45 | 29 | 1 | . | . | . | . | . | . | . | 290 | 3 |
| 9 | 1 | 86 | 1 | 2 | 5 | 1 | 5 | . | . | . | 0 | 1 | 1 | 55 | 3 | 3 | . | . | . | . | . | . | . | 51 | 2 |
| 10 | 1 | 84 | 2 | 2 | 1 | . | . | . | . | . | 1 | 1 | 1 | 50 | 3 | 3 | . | 5 | . | 4 | 3 | 5 | 1 | 1790 | . |
| 11 | 1 | 84 | 2 | 2 | 1 | 1 | . | . | . | . | 0 | 1 | 2 | 50 | 17 | 3 | . | . | . | 4 | 3 | 4 | 5 | 1765 | . |
| 12 | 1 | 84 | 2 | 2 | 1 | 1 | 2 | . | . | . | 0 | . | 1 | 35 | 4 | 2 | 2 | 1 | . | . | . | . | . | 26 | 1 |
| 13 | 1 | 80 | 1 | 2 | 5 | 1 | 5 | . | . | . | 0 | . | 2 | 25 | 13 | 4 | 4 | . | . | . | . | . | . | 12 | 1 |
| 14 | 1 | 80 | 1 | 1 | 3 | 1 | 5 | . | . | . | 1 | . | 1 | 80 | 5 | 3 | . | . | . | . | . | . | . | 55 | 3 |
| 15 | 1 | 81 | 1 | 1 | 1 | 1 | 7 | . | . | . | 0 | . | 2 | 50 | 25 | 1 | . | 1 | . | . | . | . | . | 319 | 1 |
| 16 | 1 | 81 | 1 | 2 | 1 | 4 | . | . | . | . | 0 | . | 2 | 85 | 5 | 3 | . | . | . | . | . | . | . | 739 | 2 |
| 17 | 1 | 81 | 1 | 2 | 1 | 1 | 5 | . | . | . | 0 | . | 1 | 35 | 24 | 3 | 4 | 2 | . | . | . | . | . | 23 | 0 |
| 18 | 1 | 79 | 1 | 1 | 1 | . | . | . | . | . | 0 | . | 1 | 25 | 15 | 1 | . | 7 | . | . | . | . | . | 1970 | 5 |
| 19 | 1 | 81 | 2 | 2 | 1 | . | . | . | . | . | 1 | . | 2 | 45 | 14 | 3 | . | . | . | . | . | . | . | 1830 | 3 |
| 20 | 1 | 79 | 2 | 1 | 1 | 1 | . | . | . | . | 0 | . | 1 | 80 | 4 | 3 | . | . | . | 4 | 3 | 5 | . | 1495 | . |
| 21 | 1 | 76 | 1 | 1 | 1 | 1 | . | . | . | . | 0 | . | 1 | 95 | 18 | 1 | . | . | . | . | . | . | . | 1782 | 2 |
| 22 | 1 | 75 | 2 | 1 | 2 | 1 | 2 | 3 | 5 | . | 0 | 1 | 1 | 65 | 2 | 3 | . | . | . | . | . | . | . | 72 | 3 |
| 23 | 1 | 75 | 2 | 3 | 2 | 1 | 3 | 5 | . | . | 0 | 1 | 2 | 40 | 6 | 3 | . | . | . | . | . | . | . | 2029 | 3 |
| 24 | 1 | 76 | 1 | 2 | 1 | 1 | 3 | 8 | . | . | 0 | . | 1 | 40 | 42 | 3 | . | . | . | . | . | . | . | 254 | 2 |
| 25 | 1 | 76 | 2 | 1 | 1 | 1 | 2 | 5 | . | . | 0 | . | 1 | 45 | 34 | 3 | . | . | . | . | . | . | . | 387 | 2 |
| 26 | 1 | 73 | 1 | 3 | 1 | 2 | 5 | . | . | . | 1 | . | 2 | 50 | 4 | 3 | . | 6 | . | . | . | . | . | 35 | 5 |
| 27 | 1 | 72 | 2 | 3 | 1 | 2 | 5 | . | . | . | 0 | . | 1 | 50 | 4 | 3 | . | . | . | . | . | . | . | 399 | 5 |
| 28 | 1 | 71 | 1 | 1 | 1 | 1 | 4 | 5 | . | . | 0 | 1 | 1 | 95 | 3 | 3 | . | . | . | . | . | . | . | 993 | 3 |
| 29 | 1 | 69 | 2 | 3 | 1 | 1 | 5 | . | . | . | 0 | . | 1 | 70 | 8 | 3 | . | . | . | . | . | . | . | 1809 | 4 |
| 30 | 1 | 68 | 1 | 1 | 1 | 1 | 5 | . | . | . | 0 | 4 | 1 | 50 | 28 | 1 | . | . | . | 1 | 2 | 2 | 3 | 2829 | . |
| 31 | 1 | 68 | 1 | 1 | 1 | . | . | . | . | . | 0 | . | 1 | 55 | 5 | 3 | . | . | . | . | . | . | . | 781 | 3 |
| 32 | 1 | 68 | 1 | 1 | 1 | 1 | 5 | . | . | . | 0 | 3 | 2 | 35 | 8 | 3 | . | . | . | 1 | 2 | 2 | 2 | 2481 | . |
| 33 | 1 | 68 | 1 | 3 | 2 | 1 | 2 | 5 | 8 | . | 1 | . | 1 | 40 | 3 | 3 | . | . | . | . | . | . | . | 46 | 1 |
| 34 | 1 | 68 | 2 | 2 | 1 | 1 | . | . | . | . | 0 | 1 | 1 | 50 | 7 | 4 | 1 | . | . | . | . | . | . | 5 | 2 |
| 35 | 1 | 63 | 1 | 1 | 1 | 1 | 3 | . | . | . | 1 | . | 1 | 40 | 5 | 3 | . | . | . | . | . | . | . | 376 | 2 |
| 36 | 1 | 64 | 2 | 2 | 2 | 2 | 5 | . | . | . | 0 | . | 2 | 25 | 4 | 3 | . | . | . | 3 | 3 | 2 | 5 | 1473 | . |
| 37 | 1 | 62 | 1 | 2 | 1 | 2 | 5 | . | . | . | 0 | . | 2 | 60 | 3 | 3 | . | . | . | 4 | 3 | 1 | 1 | 1993 | . |
| 38 | 1 | 63 | 1 | 1 | 1 | 1 | . | . | . | . | 0 | . | 1 | 25 | 34 | 3 | . | 1 | . | 1 | 1 | 4 | 5 | 1652 | . |
| 39 | 1 | 59 | 2 | 3 | 2 | 1 | 5 | . | . | . | 0 | . | 2 | 45 | 6 | 3 | . | . | . | 4 | 3 | 5 | 1 | 1852 | . |
| 40 | 1 | 57 | 1 | 1 | 1 | . | . | . | . | . | 0 | . | 1 | 45 | 15 | 1 | . | . | . | 1 | 2 | 1 | 2 | 2474 | . |
| 41 | 2 | 100 | 1 | 2 | 1 | 1 | . | . | . | . | 0 | . | 2 | 60 | 9 | 2 | . | . | . | 4 | 3 | 5 | . | 2182 | . |
| 42 | 2 | 97 | 2 | 2 | 5 | . | . | . | . | . | 1 | 1 | 2 | 50 | 4 | 3 | . | . | . | . | . | . | . | 437 | 6 |
| 43 | 2 | 93 | 1 | 2 | 5 | 1 | . | . | . | . | 0 | . | 1 | 40 | 3 | 3 | . | 2 | . | . | . | . | . | 116 | 1 |
| 44 | 2 | 93 | 1 | 2 | 3 | 1 | 5 | 6 | . | . | 1 | . | 2 | 40 | 6 | 3 | . | . | . | . | . | . | . | 20 | 7 |
| 45 | 2 | 92 | 1 | 2 | 1 | 3 | . | . | . | . | 0 | . | 1 | 50 | 12 | 3 | . | . | . | . | . | . | . | 830 | 3 |
| 46 | 2 | 93 | 1 | 1 | 1 | 1 | . | . | . | . | 1 | . | 2 | 25 | 19 | 3 | . | . | . | . | . | . | . | 309 | 2 |
| 47 | 2 | 90 | 1 | 2 | 1 | 1 | . | . | . | . | 1 | . | 2 | 40 | 17 | 3 | . | . | . | . | . | . | . | 436 | 2 |
| 48 | 2 | 92 | 1 | 1 | 1 | . | . | . | . | . | 0 | . | 1 | 60 | 6 | 3 | . | . | . | . | . | . | . | 575 | 1 |
| 49 | 2 | 92 | 1 | 2 | 1 | 1 | . | . | . | . | 1 | . | 1 | 55 | 31 | 3 | . | . | . | . | . | . | . | 978 | 3 |
| 50 | 2 | 88 | 1 | 2 | 5 | 1 | 3 | 5 | . | . | 0 | . | 2 | 20 | 14 | 3 | . | 2 | . | 4 | 3 | 5 | . | 2910 | . |
| 51 | 2 | 89 | 2 | 2 | 2 | 5 | 6 | . | . | . | 1 | . | 1 | 65 | 6 | 3 | . | . | . | 4 | 3 | 5 | . | 2702 | . |
| 52 | 2 | 88 | 2 | 1 | 1 | . | . | . | . | . | 1 | . | 1 | 55 | 21 | 3 | . | . | . | . | . | . | . | 210 | 1 |
| 53 | 2 | 91 | 1 | 3 | 3 | . | . | . | . | . | 0 | . | 1 | 35 | 3 | 3 | . | . | . | 4 | 3 | 4 | 5 | 1714 | . |
| 54 | 2 | 91 | 2 | 2 | 1 | 1 | 6 | . | . | . | 0 | 1 | 1 | 30 | 12 | 3 | . | . | . | . | . | . | . | 338 | 3 |
| 55 | 2 | 90 | 1 | 1 | 1 | 2 | . | . | . | . | 1 | 1 | 2 | 25 | 4 | 3 | . | . | . | . | . | . | . | 696 | 3 |
| 56 | 2 | 90 | 1 | 2 | 3 | 1 | 2 | 3 | 5 | . | 0 | 5 | 1 | 45 | 9 | 3 | 5 | 1 | . | . | . | . | . | 83 | 2 |
| 57 | 2 | 86 | 2 | 1 | 1 | 1 | . | . | . | . | 0 | . | 2 | 55 | 16 | 1 | . | . | . | 1 | 2 | 2 | 2 | 2870 | . |
| 58 | 2 | 88 | 1 | 2 | 5 | 1 | . | . | . | . | 0 | . | 1 | 70 | 10 | 3 | . | . | . | . | . | . | . | 945 | 1 |
| 59 | 2 | 89 | 2 | 1 | 1 | 1 | 5 | 8 | . | . | 0 | 5 | 1 | 65 | 19 | 3 | . | 2 | . | . | . | . | . | 1221 | 3 |
| 60 | 2 | 86 | 2 | 3 | 1 | 5 | . | . | . | . | 0 | . | 1 | 65 | 4 | 3 | . | . | . | . | . | . | . | 490 | 3 |
| 61 | 2 | 89 | 1 | 2 | 3 | 1 | 3 | 5 | . | . | 1 | 5 | 1 | 60 | 9 | 3 | . | . | . | . | . | . | . | 43 | 3 |
| 62 | 2 | 89 | 1 | 3 | 1 | 1 | 2 | 3 | 5 | 9 | 1 | . | 1 | 35 | 4 | 3 | . | . | . | 4 | 3 | 3 | 6 | 1811 | . |
| 63 | 2 | 86 | 2 | 1 | 1 | 1 | . | . | . | . | 0 | . | 1 | 40 | 9 | 3 | . | . | . | . | . | . | . | 565 | 3 |
| 64 | 2 | 88 | 2 | 2 | 1 | 1 | 3 | 6 | . | . | 0 | . | 2 | 70 | 12 | 2 | . | 2 | . | 3 | 3 | 2 | 4 | 2167 | . |
| 65 | 2 | 89 | 1 | 2 | 1 | 1 | 3 | 6 | . | . | 0 | 1 | 2 | 30 | 19 | 2 | . | . | . | 3 | 3 | 2 | 4 | 1733 | . |
| 66 | 2 | 85 | 1 | 2 | 4 | 1 | 6 | . | . | . | 1 | . | 2 | 50 | 29 | 3 | . | . | . | . | . | . | . | 1056 | 3 |
| 67 | 2 | 85 | 1 | 2 | 5 | 9 | . | . | . | . | 1 | . | 2 | 30 | 12 | 3 | . | . | . | . | . | . | . | 326 | 2 |
| 68 | 2 | 89 | 1 | 1 | 1 | . | . | . | . | . | 0 | . | 1 | 50 | 14 | 1 | . | . | . | . | . | . | . | 658 | 6 |
| 69 | 2 | 85 | 2 | 2 | 4 | 1 | . | . | . | . | 0 | . | 1 | 70 | 7 | 3 | . | . | . | . | . | . | . | 847 | 2 |
| 70 | 2 | 85 | 2 | 2 | 1 | 1 | 3 | . | . | . | 1 | . | 1 | 60 | 3 | 3 | . | . | . | . | . | . | . | 1647 | 3 |
| 71 | 2 | 85 | 1 | 1 | 1 | 1 | 5 | 6 | . | . | 1 | . | 1 | 40 | 17 | 3 | . | . | . | . | . | . | . | 210 | 3 |
| 72 | 2 | 86 | 1 | 1 | 1 | 1 | . | . | . | . | 0 | 4 | 2 | 40 | 6 | 4 | 1 | . | . | . | . | . | . | 4 | 2 |
| 73 | 2 | 84 | 2 | 3 | 5 | 3 | 5 | . | . | . | 1 | . | 1 | 40 | 1 | 3 | . | . | . | 4 | 3 | 5 | . | 2827 | . |
| 74 | 2 | 87 | 1 | 1 | 5 | 1 | 5 | 8 | . | . | 0 | . | 2 | 55 | 7 | 3 | . | . | . | . | . | . | . | 1454 | 8 |
| 75 | 2 | 88 | 1 | 1 | 1 | 1 | . | . | . | . | 0 | 1 | 2 | 35 | 3 | 3 | . | . | . | 2 | 2 | 2 | 2 | 1575 | . |
| 76 | 2 | 85 | 2 | 1 | 1 | 4 | . | . | . | . | 1 | . | 1 | 95 | 10 | 3 | . | . | . | 1 | 2 | 4 | 5 | 2687 | . |
| 77 | 2 | 86 | 1 | 1 | 2 | 1 | 3 | . | . | . | 0 | . | 2 | 55 | 5 | 3 | . | 4 | . | 1 | 2 | 3 | 4 | 2134 | . |
| 78 | 2 | 85 | 2 | 3 | 2 | 1 | 2 | 3 | 9 | . | 0 | . | 1 | 20 | 3 | 3 | . | . | . | . | . | . | . | 304 | 2 |
| 79 | 2 | 87 | 2 | 2 | 5 | 1 | 3 | 4 | 8 | . | 1 | 1 | 1 | 20 | 10 | 3 | . | 2 | . | . | . | . | . | 38 | 0 |

| ID | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 80 | 2 | 84 | 2 | 3 | 3 | 5 | . | . | . | . | 0 | 4 | 1 | 45 | 3 | 3 | . | . | . | . | . | . | . | 983 | 2 |
| 81 | 2 | 86 | 2 | 1 | 1 | 1 | 3 | . | . | . | 1 | . | 2 | 40 | 11 | 3 | . | . | . | . | . | . | . | 2070 | 3 |
| 82 | 2 | 86 | 2 | 2 | 1 | 5 | . | . | . | . | 1 | . | 2 | 85 | 4 | 2 | . | . | . | . | . | . | . | 48 | 2 |
| 83 | 2 | 87 | 2 | 3 | 3 | 1 | . | . | . | . | 0 | . | 1 | 70 | 5 | 3 | . | . | . | . | . | . | . | 1112 | 2 |
| 84 | 2 | 84 | 1 | 1 | 1 | 1 | . | . | . | . | 1 | . | 1 | 70 | 5 | 3 | . | . | . | . | . | . | . | 2167 | 2 |
| 85 | 2 | 83 | 2 | 1 | 1 | 1 | . | . | . | . | 0 | . | 2 | 55 | 17 | 3 | . | . | . | . | . | . | . | 2045 | 5 |
| 86 | 2 | 84 | 1 | 1 | 2 | 1 | 3 | . | . | . | 0 | . | 2 | 45 | 14 | 3 | . | . | . | . | . | . | . | 1871 | 5 |
| 87 | 2 | 85 | 2 | 1 | 1 | 5 | 7 | . | . | . | 1 | . | 1 | 70 | 28 | 3 | . | . | . | . | . | . | . | 471 | 2 |
| 88 | 2 | 86 | 1 | 2 | 1 | 1 | 6 | . | . | . | 0 | 1 | 1 | 25 | 5 | 2 | . | 2 | . | 4 | 3 | 5 | . | 1796 | . |
| 89 | 2 | 84 | 2 | 1 | 1 | 5 | 9 | . | . | . | 0 | . | 1 | 60 | 3 | 3 | . | . | . | . | . | . | . | 660 | 4 |
| 90 | 2 | 85 | 1 | 1 | 1 | 1 | 6 | . | . | . | 0 | 1 | 1 | 60 | 7 | 3 | . | . | . | 1 | 1 | 2 | 4 | 1788 | . |
| 91 | 2 | 85 | 1 | 1 | 1 | 5 | . | . | . | . | 0 | 1 | 2 | 30 | 21 | 1 | . | . | . | 4 | 3 | 3 | 4 | 1638 | . |
| 92 | 2 | 85 | 1 | 1 | 1 | 1 | 4 | . | . | . | 0 | 1 | 1 | 35 | 13 | 3 | . | . | . | 4 | 3 | 5 | . | 1585 | . |
| 93 | 2 | 81 | 2 | 1 | 1 | . | . | . | . | . | 0 | . | 2 | 25 | 11 | 3 | . | . | . | . | . | . | . | 1502 | 5 |
| 94 | 2 | 83 | 2 | 1 | 1 | 1 | . | . | . | . | 1 | . | 2 | 40 | 14 | 3 | . | . | . | 1 | 2 | 2 | 4 | 2086 | . |
| 95 | 2 | 81 | 2 | 1 | 1 | 1 | 4 | 5 | . | . | 1 | . | 2 | 45 | 11 | 3 | . | . | . | . | . | . | . | 333 | 3 |
| 96 | 2 | 82 | 2 | 3 | 2 | . | . | . | . | . | 1 | . | 2 | 35 | 4 | 3 | . | . | . | . | . | . | . | 286 | 2 |
| 97 | 2 | 83 | 2 | 2 | 5 | 1 | 3 | 4 | 5 | . | 0 | . | 1 | 45 | 24 | 2 | . | 3 | . | 3 | 2 | 2 | 4 | 1806 | . |
| 98 | 2 | 80 | 1 | 2 | 2 | 1 | 4 | 6 | . | . | 0 | 1 | 1 | 60 | 16 | 2 | . | . | . | . | . | . | . | 1227 | 8 |
| 99 | 2 | 82 | 2 | 2 | 5 | 1 | . | . | . | . | 0 | 1 | 2 | 40 | 35 | 3 | . | . | . | . | . | . | . | 1702 | 3 |
| 100 | 2 | 82 | 2 | 3 | 1 | 1 | 5 | . | . | . | 0 | . | 2 | 65 | 2 | 3 | . | . | . | 4 | 3 | 5 | . | 1878 | . |
| 101 | 2 | 80 | 1 | 3 | 1 | 1 | 2 | 3 | 5 | . | 0 | . | 2 | 35 | 3 | 3 | . | 5 | . | . | . | . | . | 1276 | 2 |
| 102 | 2 | 80 | 2 | 3 | 1 | 1 | 2 | 3 | 5 | . | 0 | . | 2 | 40 | 5 | 3 | . | . | . | . | . | . | . | 1187 | 2 |
| 103 | 2 | 79 | 2 | 1 | 1 | . | . | . | . | . | 0 | . | 1 | 40 | 4 | 3 | . | . | . | . | . | . | . | 2554 | 6 |
| 104 | 2 | 79 | 1 | 1 | 1 | 1 | . | . | . | . | 0 | . | 1 | 65 | 4 | 3 | . | . | . | 1 | 2 | 1 | 1 | 2631 | . |
| 105 | 2 | 80 | 2 | 1 | 1 | 5 | . | . | . | . | 0 | . | 2 | 40 | 37 | 1 | . | . | . | . | . | . | . | 926 | 4 |
| 106 | 2 | 82 | 2 | 1 | 1 | 1 | . | . | . | . | 1 | . | 1 | 65 | 14 | 3 | . | . | . | 4 | 3 | 5 | . | 1497 | . |
| 107 | 2 | 82 | 2 | 1 | 1 | 1 | 6 | . | . | . | 1 | . | 1 | 35 | 16 | 1 | . | . | . | 1 | 1 | 3 | 2 | 1469 | . |
| 108 | 2 | 79 | 2 | 2 | 1 | 1 | . | . | . | . | 1 | . | 1 | 35 | 7 | 3 | . | . | . | . | . | . | . | 2564 | 6 |
| 109 | 2 | 81 | 2 | 1 | 2 | . | . | . | . | . | 0 | . | 2 | 30 | 3 | 3 | . | . | . | . | . | . | . | 776 | 3 |
| 110 | 2 | 82 | 1 | 1 | 3 | . | . | . | . | . | 0 | 1 | 2 | 45 | 5 | 3 | . | 2 | . | . | . | . | . | 523 | 3 |
| 111 | 2 | 81 | 1 | 1 | 1 | 1 | 5 | . | . | . | 0 | 1 | 2 | 30 | 16 | 1 | . | . | . | 1 | 2 | 2 | 4 | 1749 | . |
| 112 | 2 | 78 | 2 | 3 | 1 | 5 | . | . | . | . | 0 | . | 1 | 50 | 4 | 3 | . | . | . | . | . | . | . | 255 | 6 |
| 113 | 2 | 81 | 2 | 1 | 1 | 1 | 3 | 5 | . | . | 0 | 1 | 1 | 65 | 5 | 3 | . | 5 | . | 4 | 3 | 3 | 6 | 1481 | . |
| 114 | 2 | 79 | 2 | 2 | 2 | 1 | 5 | . | . | . | 1 | 1 | 1 | 75 | 7 | 3 | . | . | . | . | . | . | . | 1419 | 6 |
| 115 | 2 | 80 | 2 | 1 | 5 | 9 | . | . | . | . | 0 | . | 2 | 50 | 3 | 3 | . | . | . | . | . | . | . | 134 | 5 |
| 116 | 2 | 79 | 1 | 1 | 1 | 1 | 3 | . | . | . | 1 | 4 | 2 | 30 | 10 | 3 | . | . | . | . | . | . | . | 172 | 1 |
| 117 | 2 | 77 | 2 | 1 | 1 | 1 | . | . | . | . | 1 | . | 2 | 30 | 9 | 3 | . | . | . | 3 | 3 | 4 | 5 | 2805 | . |
| 118 | 2 | 78 | 1 | 1 | 1 | 1 | 3 | . | . | . | 1 | . | 1 | 90 | 8 | 3 | . | . | . | . | . | . | . | 174 | 5 |
| 119 | 2 | 77 | 1 | 1 | 1 | 5 | . | . | . | . | 1 | . | 1 | 70 | 6 | 3 | . | . | . | 4 | 3 | 5 | . | 2599 | . |
| 120 | 2 | 77 | 1 | 3 | 1 | 5 | . | . | . | . | 0 | . | 2 | 55 | 8 | 3 | . | . | . | . | . | . | . | 706 | 5 |
| 121 | 2 | 78 | 2 | 3 | 1 | 1 | . | . | . | . | 1 | . | 2 | 25 | 14 | 3 | . | 2 | . | . | . | . | . | 227 | 6 |
| 122 | 2 | 79 | 1 | 3 | 1 | 1 | 3 | 5 | 6 | . | 1 | . | 2 | 95 | 3 | 3 | . | . | . | . | . | . | . | 3 | 2 |
| 123 | 2 | 79 | 1 | 3 | 1 | 5 | . | . | . | . | 1 | 1 | 2 | 25 | 4 | 3 | . | . | . | . | . | . | . | 1618 | 8 |
| 124 | 2 | 80 | 1 | 1 | 5 | 1 | 3 | 5 | . | . | 1 | 4 | 2 | 40 | 6 | 3 | . | . | . | . | . | . | . | 838 | 6 |
| 125 | 2 | 79 | 1 | 1 | 1 | 1 | . | . | . | . | 0 | 1 | 2 | 45 | 21 | 1 | . | . | . | . | . | . | . | 1486 | 2 |
| 126 | 2 | 78 | 2 | 2 | 1 | 4 | . | . | . | . | 1 | . | 1 | 50 | 2 | 3 | . | . | . | . | . | . | . | 1374 | 4 |
| 127 | 2 | 78 | 1 | 1 | 1 | 1 | . | . | . | . | 0 | 4 | 1 | 40 | 13 | 1 | . | . | . | 1 | 2 | 1 | 2 | 1795 | . |
| 128 | 2 | 76 | 2 | 1 | 1 | . | . | . | . | . | 0 | . | 1 | 95 | 18 | 1 | . | . | . | 1 | 1 | 2 | 1 | 2572 | . |
| 129 | 2 | 77 | 1 | 2 | 3 | 1 | 5 | . | . | . | 0 | . | 1 | 35 | 22 | 3 | . | . | . | 4 | 3 | 5 | . | 2125 | . |
| 130 | 2 | 78 | 2 | 1 | 3 | 1 | 5 | . | . | . | 0 | . | 1 | 45 | 13 | 2 | . | . | . | 4 | 3 | 5 | . | 1916 | . |
| 131 | 2 | 78 | 2 | 3 | 3 | 1 | 9 | . | . | . | 0 | 1 | 1 | 60 | 5 | 3 | . | . | . | . | . | . | . | 530 | 2 |
| 132 | 2 | 78 | 1 | 1 | 1 | . | . | . | . | . | 0 | . | 2 | 55 | 18 | 1 | . | . | . | 3 | 3 | 3 | 4 | 1960 | . |
| 133 | 2 | 79 | 2 | 1 | 1 | . | . | . | . | . | 1 | . | 2 | 55 | 20 | 1 | . | . | . | . | . | . | . | 115 | 5 |
| 134 | 2 | 79 | 1 | 1 | 1 | 3 | . | . | . | . | 0 | 1 | 2 | 35 | 7 | 3 | . | . | . | 3 | 3 | 2 | 4 | 1540 | . |
| 135 | 2 | 78 | 2 | 1 | 5 | 1 | 3 | . | . | . | 1 | 5 | 1 | 55 | 8 | 3 | . | . | . | . | . | . | . | 71 | 2 |
| 136 | 2 | 76 | 2 | 3 | 1 | 2 | 4 | 5 | . | . | 0 | . | 2 | 45 | 4 | 3 | . | . | . | . | . | . | . | 1492 | 2 |
| 137 | 2 | 77 | 1 | 1 | 1 | 5 | . | . | . | . | 1 | 1 | 1 | 35 | 3 | 3 | . | . | . | . | . | . | . | 437 | 2 |
| 138 | 2 | 78 | 2 | 1 | 1 | 1 | . | . | . | . | 0 | . | 1 | 45 | 6 | 3 | . | . | . | 1 | 2 | 2 | 4 | 1504 | . |
| 139 | 2 | 77 | 1 | 2 | 2 | 1 | 2 | . | . | . | 1 | 4 | 2 | 25 | 4 | 3 | . | . | . | . | . | . | . | 38 | 0 |
| 140 | 2 | 77 | 1 | 1 | 1 | 1 | 3 | 5 | . | . | 0 | . | 2 | 50 | 137 | 3 | . | 1 | . | 4 | 3 | 5 | 6 | 1539 | . |
| 141 | 2 | 75 | 1 | 3 | 4 | 1 | 3 | 5 | . | . | 0 | . | 2 | 45 | 2 | 3 | . | 5 | . | 4 | 3 | 5 | . | 2426 | . |
| 142 | 2 | 75 | 1 | 1 | 1 | 1 | 4 | . | . | . | 0 | . | 1 | 65 | 7 | 3 | . | 5 | 1 | . | . | . | . | 76 | 3 |
| 143 | 2 | 75 | 1 | 2 | 1 | 1 | 7 | 8 | . | . | 1 | 4 | 2 | 45 | 6 | 3 | . | 2 | 3 | 4 | 3 | 5 | . | 2093 | . |
| 144 | 2 | 76 | 2 | 2 | 3 | . | . | . | . | . | 1 | . | 2 | 35 | 16 | 2 | . | . | . | 4 | 3 | 5 | . | 1677 | . |
| 145 | 2 | 75 | 2 | 2 | 3 | 3 | . | . | . | . | 1 | . | 1 | 35 | 4 | 3 | . | 2 | . | . | . | . | . | 47 | 2 |
| 146 | 2 | 73 | 1 | 1 | 1 | . | . | . | . | . | 0 | . | 1 | 40 | 7 | 3 | . | . | . | 3 | 3 | 2 | 2 | 2677 | . |
| 147 | 2 | 74 | 1 | 2 | 1 | 1 | . | . | . | . | 1 | . | 2 | 75 | 35 | 3 | . | . | . | 3 | 3 | 4 | 5 | 2177 | . |
| 148 | 2 | 74 | 2 | 3 | 1 | 5 | . | . | . | . | 1 | . | 2 | 65 | 3 | 3 | . | 7 | . | . | . | . | . | 394 | 1 |
| 149 | 2 | 73 | 2 | 1 | 1 | 1 | . | . | . | . | 1 | . | 2 | 60 | 18 | 3 | . | . | . | 1 | 2 | 2 | 4 | 2463 | . |
| 150 | 2 | 73 | 1 | 3 | 1 | 1 | 5 | . | . | . | 0 | . | 1 | 55 | 4 | 3 | 3 | . | . | 4 | 3 | 2 | 1 | 2442 | . |
| 151 | 2 | 73 | 2 | 2 | 1 | 1 | . | . | . | . | 0 | . | 1 | 45 | 3 | 3 | . | . | . | 3 | 3 | 5 | 6 | 2334 | . |
| 152 | 2 | 74 | 2 | 1 | 1 | . | . | . | . | . | 0 | 1 | 2 | 55 | 6 | 3 | . | . | . | 1 | 2 | 1 | 2 | 1579 | . |
| 153 | 2 | 71 | 2 | 1 | 1 | . | . | . | . | . | 0 | . | 1 | 35 | 7 | 3 | . | . | . | . | . | . | . | 317 | 4 |
| 154 | 2 | 74 | 1 | 1 | 1 | 1 | 3 | 9 | . | . | 0 | . | 1 | 65 | 15 | 1 | . | . | . | 1 | 2 | 2 | 4 | 1804 | . |
| 155 | 2 | 71 | 1 | 1 | 1 | 5 | . | . | . | . | 1 | . | 2 | 25 | 21 | 1 | . | . | . | 1 | 1 | 2 | 2 | 2894 | . |
| 156 | 2 | 74 | 2 | 3 | 1 | 5 | 6 | . | . | . | 0 | 1 | 1 | 25 | 4 | 3 | . | . | . | . | . | . | . | 519 | 1 |
| 157 | 2 | 71 | 2 | 1 | 1 | . | . | . | . | . | 0 | . | 1 | 65 | 17 | 1 | . | . | . | 2 | 1 | 2 | 2 | 2665 | . |
| 158 | 2 | 73 | 1 | 2 | 1 | 1 | 2 | 3 | 8 | 9 | 0 | . | 2 | 35 | 7 | 3 | . | . | . | . | . | . | . | 58 | 4 |
| 159 | 2 | 73 | 1 | 1 | 1 | 1 | 2 | 5 | 9 | . | 1 | . | 2 | 40 | 19 | 3 | . | . | . | . | . | . | . | 1033 | 5 |
| 160 | 2 | 70 | 2 | 1 | 1 | 1 | 4 | . | . | . | 1 | . | 1 | 60 | 12 | 4 | 1 | . | . | . | . | . | . | 10 | 2 |
| 161 | 2 | 72 | 1 | 3 | 2 | 1 | 2 | 5 | 9 | . | 0 | . | 2 | 20 | 17 | 3 | . | . | . | . | . | . | . | 253 | 8 |
| 162 | 2 | 70 | 1 | 3 | 2 | 1 | 3 | . | . | . | 1 | . | 1 | 40 | 4 | 3 | . | . | . | . | . | . | . | 173 | 2 |

| ID | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 163 | 2 | 70 | 2 | 1 | 1 | 1 | 6 | . | . | . | 1 | . | 2 | 40 | 8 | 3 | 3 | . | . | 4 | 3 | 5 | 6 | 2169 | . |
| 164 | 2 | 68 | 2 | 1 | 1 | 1 | . | . | . | . | 0 | 4 | 1 | 40 | 24 | 1 | . | . | . | . | . | . | . | 890 | 7 |
| 165 | 2 | 71 | 2 | 1 | 1 | 1 | . | . | . | . | 0 | 3 | 2 | 45 | 16 | 1 | . | . | . | 1 | 1 | 2 | 2 | 1725 | . |
| 166 | 2 | 68 | 1 | 2 | 1 | 5 | . | . | . | . | 0 | . | 1 | 40 | 4 | 3 | . | 2 | . | . | . | . | . | 1110 | 1 |
| 167 | 2 | 69 | 1 | 1 | 1 | 1 | 5 | . | . | . | 0 | 1 | 1 | 30 | 10 | 1 | . | . | . | . | . | . | . | 1368 | 2 |
| 168 | 2 | 68 | 1 | 1 | 1 | . | . | . | . | . | 0 | . | 2 | 45 | 15 | 1 | . | . | . | 1 | 2 | 2 | 2 | 2055 | . |
| 169 | 2 | 68 | 2 | 1 | 1 | 1 | 3 | 5 | . | . | 0 | . | 2 | 40 | 3 | 3 | 1 | 1 | . | . | . | . | . | 26 | 2 |
| 170 | 2 | 67 | 1 | 3 | 3 | 1 | 5 | . | . | . | 0 | . | 2 | 55 | 2 | 3 | . | . | . | . | . | . | . | 75 | 3 |
| 171 | 2 | 65 | 2 | 1 | 1 | 1 | 5 | . | . | . | 0 | . | 1 | 50 | 26 | 1 | . | 3 | . | 4 | 3 | 2 | 4 | 2593 | . |
| 172 | 2 | 66 | 2 | 1 | 1 | 3 | . | . | . | . | 0 | 1 | 1 | 70 | 14 | 1 | . | . | . | . | . | . | . | 1285 | 8 |
| 173 | 2 | 64 | 2 | 2 | 2 | 5 | . | . | . | . | 0 | . | 2 | 45 | 16 | 3 | . | 4 | . | 3 | 2 | 4 | 5 | 2286 | . |
| 174 | 2 | 58 | 1 | 1 | 1 | 2 | . | . | . | . | 1 | . | 2 | 30 | 13 | 1 | . | . | . | 1 | 1 | 1 | 1 | 1850 | . |
| 175 | 2 | 89 | 1 | 3 | 2 | 1 | 4 | 5 | . | . | 0 | 1 | 1 | 85 | 5 | 3 | . | . | . | . | . | . | . | 23 | 2 |
| 176 | 2 | 85 | 2 | 1 | 5 | 1 | 5 | . | . | . | 0 | . | 1 | 45 | 8 | 4 | 1 | . | . | . | . | . | . | 5 | 2 |
| 177 | 2 | 82 | 1 | 2 | 1 | 5 | . | . | . | . | 1 | . | 1 | 40 | 9 | 3 | . | . | . | . | . | . | . | 446 | 2 |
| 178 | 2 | 80 | 2 | 1 | 1 | 1 | . | . | . | . | 1 | . | 1 | 45 | 6 | 3 | . | . | . | . | . | . | . | 108 | 0 |
| 179 | 2 | 79 | 1 | 2 | 4 | 1 | 5 | . | . | . | 0 | . | 1 | 45 | 6 | 2 | . | . | . | . | . | . | . | 1233 | 3 |
| 180 | 1 | 79 | 2 | 3 | 1 | 5 | . | . | . | . | 0 | . | 2 | 60 | 4 | 3 | . | . | . | . | . | . | . | 1486 | 6 |
| 181 | 2 | 79 | 1 | 3 | 1 | 1 | 5 | . | . | . | 0 | . | 1 | 35 | 2 | 3 | . | . | . | 4 | 3 | 3 | 6 | 2091 | . |
| 182 | 2 | 77 | 2 | 1 | 1 | 3 | . | . | . | . | 0 | 1 | 2 | 30 | 7 | 3 | . | 3 | . | 1 | 1 | 2 | 3 | 1579 | . |
| 183 | 2 | 77 | 2 | 2 | 1 | 1 | 3 | . | . | . | 1 | . | 2 | 50 | 6 | 3 | . | . | . | . | . | . | . | 128 | 0 |
| 184 | 1 | 72 | 1 | 1 | 1 | 1 | 3 | . | . | . | 0 | 1 | 1 | 70 | 14 | 1 | . | . | . | 1 | 1 | 2 | 4 | 2441 | . |
| 185 | 2 | 69 | 2 | 1 | 1 | 9 | . | . | . | . | 1 | . | 2 | 95 | 5 | 3 | . | . | . | . | . | . | . | 1439 | 2 |

ID Case (patient/control)

A Sex
- 1 male
- 2 female

B Age at fracture (years)

C Side
- 1 left
- 2 right

D Habitat, prefracture
- 1 own home
- 2 old people's home
- 3 hospital

E Locomotor ability before fracture
- 1 walked without aid
- 2 used walking aid
- 3 could walk accompanied
- 4 bedridden
- 5 not known

F–J Associated diseases
- 1 cardiovascular
- 2 pulmonary
- 3 metabolic
- 4 locomotor
- 5 neurologic or mental
- 6 chronic urinary tract infection
- 7 gastrointestinal
- 8 other concurrent fracture
- 9 other

K Prophylactic antibiotics
- 0 no
- 1 yes

L Antithrombotic prophylaxis
- 1 acetylsalicylic acid
- 2 dipyridamol
- 3 acetylsalicylic acid + dipyridamol
- 4 warfarin
- 5 heparin

M Surgeon
- 1 resident
- 2 general or orthopedic specialist

N Duration of operation (minutes)

O Hospital time (days)

P Discharged to
- 1 own home
- 2 old people's home
- 3 other hospital
- 4 died during hospitalization

Q General complications
- 1 myocardial infarction
- 2 pulmonary embolism
- 3 deep-vein thrombosis
- 4 pneumonia
- 5 bedsore

R,S Local complications
- 1 infection
- 2 luxation
- 3 loosening
- 4 severe acetabulum erosion
- 5 fracture
- 6 wound dehiscence
- 7 seroma

T Habitat at follow-up
- 1 own home
- 2 service block
- 3 old people's home
- 4 hospital

U Lived alone at follow-up
- 1 yes
- 2 no
- 3 at institution

V Locomotor stability at follow-up
- 1 could walk alone outdoors
- 2 could walk alone indoors
- 3 could walk supported by other person
- 4 used wheelchair
- 5 bedridden

W Walking aids
- 1 none
- 2 cane
- 3 crutches
- 4 walking-frame
- 5 wheelchair
- 6 bedridden

X Survival time/follow-up time (days)

Y Cause of death
- 0 fracture of femoral neck
- 1 respiratory
- 2 heart disease
- 3 vascular
- 4 gastrointestinal
- 5 malignoma
- 6 neurologic or mental
- 7 other accident
- 8 other

**Controls**

| ID | A | B | T | U | V | W | X | Y |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 92 | . | . | . | . | 1423 | 3 |
| 2 | 1 | 89 | . | . | . | . | 437 | 5 |
| 3 | 1 | 90 | . | . | . | . | 1208 | 1 |
| 4 | 1 | 90 | . | . | . | . | 1016 | 5 |
| 5 | 1 | 86 | . | . | . | . | 735 | 2 |
| 6 | 1 | 88 | . | . | . | . | 1627 | 3 |
| 7 | 1 | 86 | . | . | . | . | 504 | 5 |
| 8 | 1 | 85 | . | . | . | . | 31 | 2 |
| 9 | 1 | 87 | . | . | . | . | 955 | 5 |
| 10 | 1 | 84 | . | . | . | . | 680 | 5 |
| 11 | 1 | 84 | . | . | . | . | 1364 | 2 |
| 12 | 1 | 83 | . | . | . | . | 1069 | 3 |
| 13 | 1 | 80 | . | . | . | . | 1109 | 4 |
| 14 | 1 | 80 | . | . | . | . | 1361 | 2 |
| 15 | 1 | 81 | . | . | . | . | 1193 | 1 |
| 16 | 1 | 81 | . | . | . | . | 702 | 4 |
| 17 | 1 | 81 | . | . | . | . | 480 | 2 |
| 18 | 1 | 79 | . | . | . | . | 2341 | 4 |
| 19 | 1 | 80 | . | . | . | . | 1493 | 3 |
| 20 | 1 | 80 | . | . | . | . | 213 | 5 |
| 21 | 1 | 76 | 1 | 1 | 2 | 1 | 2565 | . |
| 22 | 1 | 75 | . | . | . | . | 1047 | 5 |
| 23 | 1 | 75 | . | . | . | . | 756 | 2 |
| 24 | 1 | 76 | 1 | 2 | 1 | 1 | 1594 | . |
| 25 | 1 | 77 | . | . | . | . | 1309 | 2 |
| 26 | 1 | 73 | . | . | . | . | 451 | 2 |
| 27 | 1 | 72 | 1 | 2 | 1 | 1 | 2555 | . |
| 28 | 1 | 71 | 1 | 2 | 1 | 1 | 2325 | . |
| 29 | 1 | 69 | 1 | 2 | 1 | 1 | 2588 | . |
| 30 | 1 | 68 | 1 | 2 | 1 | 1 | 2829 | . |
| 31 | 1 | 68 | 1 | 2 | 1 | 1 | 2809 | . |
| 32 | 1 | 68 | 1 | 2 | 1 | 1 | 2481 | . |
| 33 | 1 | 68 | 4 | 3 | 5 | . | 2044 | . |
| 34 | 1 | 68 | 1 | 2 | 1 | 1 | 1593 | . |
| 35 | 1 | 63 | 1 | 2 | 2 | 1 | 2490 | . |
| 36 | 1 | 64 | 1 | 2 | 1 | 1 | 1473 | . |
| 37 | 1 | 62 | 1 | 2 | 1 | 1 | 1993 | . |
| 38 | 1 | 63 | 1 | 2 | 1 | 1 | 1652 | . |
| 39 | 1 | 59 | 1 | 2 | 1 | 1 | 1852 | . |
| 40 | 1 | 57 | 4 | 3 | 4 | 5 | 2474 | . |
| 41 | 2 | 96 | . | . | . | . | 1089 | 6 |
| 42 | 2 | 98 | . | . | . | . | 303 | 5 |
| 43 | 2 | 93 | . | . | . | . | 2680 | 3 |
| 44 | 2 | 93 | . | . | . | . | 134 | 2 |
| 45 | 2 | 92 | . | . | . | . | 2268 | 2 |
| 46 | 2 | 92 | . | . | . | . | 646 | 4 |
| 47 | 2 | 90 | . | . | . | . | 2267 | 8 |
| 48 | 2 | 91 | . | . | . | . | 225 | 8 |
| 49 | 2 | 91 | . | . | . | . | 376 | 2 |
| 50 | 2 | 88 | 4 | 3 | 4 | 5 | 2910 | . |
| 51 | 2 | 89 | . | . | . | . | 343 | 2 |
| 52 | 2 | 88 | . | . | . | . | 547 | 2 |
| 53 | 2 | 90 | . | . | . | . | 1017 | 6 |
| 54 | 2 | 90 | . | . | . | . | 684 | 2 |
| 55 | 2 | 90 | . | . | . | . | 262 | 8 |
| 56 | 2 | 89 | . | . | . | . | 152 | 1 |
| 57 | 2 | 86 | . | . | . | . | 391 | 3 |
| 58 | 2 | 88 | . | . | . | . | 56 | 2 |
| 59 | 2 | 89 | . | . | . | . | 59 | 3 |
| 60 | 2 | 86 | . | . | . | . | 1088 | 8 |
| 61 | 2 | 89 | . | . | . | . | 587 | 5 |
| 62 | 2 | 88 | . | . | . | . | 140 | 2 |
| 63 | 2 | 86 | . | . | . | . | 1274 | 3 |
| 64 | 2 | 88 | . | . | . | . | 1550 | 3 |
| 65 | 2 | 88 | . | . | . | . | 1323 | 1 |
| 66 | 2 | 86 | . | . | . | . | 2340 | 5 |
| 67 | 2 | 85 | . | . | . | . | 81 | 5 |
| 68 | 2 | 90 | . | . | . | . | 957 | 5 |
| 69 | 2 | 85 | . | . | . | . | 306 | 7 |
| 70 | 2 | 84 | . | . | . | . | 2278 | 2 |
| 71 | 2 | 85 | . | . | . | . | 1312 | 3 |
| 72 | 2 | 86 | . | . | . | . | 2197 | 1 |
| 73 | 2 | 85 | . | . | . | . | 2290 | 4 |
| 74 | 2 | 87 | . | . | . | . | 1275 | 2 |
| 75 | 2 | 87 | . | . | . | . | 929 | 3 |
| 76 | 2 | 84 | . | . | . | . | 697 | 2 |
| 77 | 2 | 86 | . | . | . | . | 804 | 2 |
| 78 | 2 | 85 | . | . | . | . | 905 | 5 |
| 79 | 2 | 87 | . | . | . | . | 78 | 1 |
| 80 | 2 | 83 | . | . | . | . | 1718 | 2 |
| 81 | 2 | 86 | . | . | . | . | 1796 | 5 |
| 82 | 2 | 86 | . | . | . | . | 424 | 3 |
| 83 | 2 | 87 | . | . | . | . | 956 | 6 |
| 84 | 2 | 84 | . | . | . | . | 1713 | 4 |
| 85 | 2 | 83 | . | . | . | . | 2010 | 5 |
| 86 | 2 | 84 | . | . | . | . | 664 | 2 |
| 87 | 2 | 85 | . | . | . | . | 1205 | 2 |
| 88 | 2 | 85 | . | . | . | . | 992 | 2 |
| 89 | 2 | 85 | . | . | . | . | 1759 | 0 |
| 90 | 2 | 85 | . | . | . | . | 1409 | 1 |
| 91 | 2 | 85 | . | . | . | . | 945 | 4 |
| 92 | 2 | 85 | . | . | . | . | 1312 | 2 |
| 93 | 2 | 81 | . | . | . | . | 1305 | 3 |
| 94 | 2 | 83 | . | . | . | . | 1384 | 2 |
| 95 | 2 | 81 | . | . | . | . | 1182 | 5 |
| 96 | 2 | 82 | . | . | . | . | 2021 | 3 |
| 97 | 2 | 83 | . | . | . | . | 654 | 5 |
| 98 | 2 | 81 | . | . | . | . | 532 | 2 |
| 99 | 2 | 82 | . | . | . | . | 1337 | 8 |
| 100 | 2 | 82 | . | . | . | . | 552 | 2 |
| 101 | 2 | 79 | . | . | . | . | 1529 | 5 |
| 102 | 2 | 80 | . | . | . | . | 961 | 5 |
| 103 | 2 | 79 | . | . | . | . | 2630 | 2 |
| 104 | 2 | 79 | . | . | . | . | 1736 | 3 |
| 105 | 2 | 80 | . | . | . | . | 966 | 3 |
| 106 | 2 | 82 | . | . | . | . | 1054 | 2 |
| 107 | 2 | 82 | . | . | . | . | 304 | 5 |
| 108 | 2 | 78 | . | . | . | . | 2389 | 1 |
| 109 | 2 | 80 | . | . | . | . | 1566 | 2 |
| 110 | 2 | 82 | 2 | 2 | 2 | 1 | 1574 | . |
| 111 | 2 | 80 | . | . | . | . | 1392 | 6 |
| 112 | 2 | 79 | . | . | . | . | 1342 | 5 |
| 113 | 2 | 81 | . | . | . | . | 541 | 3 |
| 114 | 2 | 78 | . | . | . | . | 777 | 2 |
| 115 | 2 | 80 | . | . | . | . | 1717 | 8 |
| 116 | 2 | 79 | . | . | . | . | 1257 | 2 |
| 117 | 2 | 77 | . | . | . | . | 1142 | 8 |
| 118 | 2 | 78 | 4 | 3 | 4 | 5 | 2314 | . |
| 119 | 2 | 77 | . | . | . | . | 917 | 3 |
| 120 | 2 | 77 | 1 | 1 | 2 | 1 | 2428 | . |
| 121 | 2 | 78 | 1 | 1 | 1 | 4 | 2062 | . |
| 122 | 2 | 79 | . | . | . | . | 511 | 2 |
| 123 | 2 | 80 | . | . | . | . | 1615 | 8 |
| 124 | 2 | 79 | . | . | . | . | 979 | 1 |
| 125 | 2 | 79 | . | . | . | . | 1315 | 3 |
| 126 | 2 | 78 | 3 | 3 | 2 | 4 | 2106 | . |
| 127 | 2 | 78 | . | . | . | . | 1444 | 3 |
| 128 | 2 | 76 | 1 | 1 | 1 | 1 | 2572 | . |
| 129 | 2 | 77 | . | . | . | . | 1572 | 2 |
| 130 | 2 | 78 | 1 | 1 | 2 | 2 | 1916 | . |
| 131 | 2 | 78 | 1 | 1 | 2 | 2 | 1834 | . |
| 132 | 2 | 77 | . | . | . | . | 1616 | 1 |
| 133 | 2 | 79 | 4 | 3 | 4 | 5 | 1538 | . |
| 134 | 2 | 79 | 2 | 1 | 2 | 2 | 1540 | . |
| 135 | 2 | 78 | . | . | . | . | 755 | 2 |
| 136 | 2 | 76 | . | . | . | . | 725 | 2 |
| 137 | 2 | 77 | . | . | . | . | 735 | 2 |
| 138 | 2 | 78 | 1 | 2 | 2 | 1 | 1504 | . |
| 139 | 2 | 76 | . | . | . | . | 1442 | 8 |
| 140 | 2 | 77 | 1 | 1 | 1 | 1 | 1539 | . |
| 141 | 2 | 75 | . | . | . | . | 1654 | 3 |
| 142 | 2 | 75 | 1 | 1 | 2 | 1 | 2156 | . |
| 143 | 2 | 75 | 1 | 1 | 1 | 1 | 2093 | . |
| 144 | 2 | 76 | . | . | . | . | 625 | 2 |
| 145 | 2 | 75 | 1 | 2 | 1 | 1 | 2040 | . |
| 146 | 2 | 73 | . | . | . | . | 2369 | 3 |
| 147 | 2 | 74 | 1 | 2 | 3 | 4 | 2177 | . |
| 148 | 2 | 74 | 3 | 3 | 1 | 1 | 2112 | . |
| 149 | 2 | 73 | 1 | 2 | 1 | 1 | 2463 | . |
| 150 | 2 | 73 | . | . | . | . | 2234 | 2 |
| 151 | 2 | 73 | 1 | 2 | 2 | 1 | 2334 | . |
| 152 | 2 | 74 | 1 | 1 | 1 | 1 | 1579 | . |
| 153 | 2 | 71 | . | . | . | . | 2006 | 5 |
| 154 | 2 | 74 | 1 | 1 | 1 | 1 | 1804 | . |
| 155 | 2 | 71 | 2 | 1 | 2 | 2 | 2894 | . |
| 156 | 2 | 74 | 1 | 1 | 1 | 1 | 1720 | . |
| 157 | 2 | 71 | 1 | 1 | 1 | 1 | 2665 | . |
| 158 | 2 | 73 | 3 | 3 | 4 | 5 | 1784 | . |
| 159 | 2 | 72 | . | . | . | . | 1553 | 8 |
| 160 | 2 | 70 | 1 | 1 | 1 | 1 | 2443 | . |
| 161 | 2 | 72 | 1 | 2 | 2 | 2 | 1708 | . |
| 162 | 2 | 71 | 1 | 2 | 1 | 1 | 2163 | . |
| 163 | 2 | 70 | 1 | 2 | 2 | 1 | 2169 | . |
| 164 | 2 | 68 | 1 | 2 | 1 | 1 | 2783 | . |
| 165 | 2 | 71 | 1 | 2 | 1 | 1 | 1725 | . |
| 166 | 2 | 68 | 1 | 2 | 2 | 1 | 2397 | . |
| 167 | 2 | 69 | 1 | 2 | 2 | 1 | 1517 | . |
| 168 | 2 | 68 | 1 | 1 | 2 | 4 | 2055 | . |
| 169 | 2 | 68 | 1 | 1 | 1 | 1 | 1939 | . |
| 170 | 2 | 67 | 1 | 2 | 1 | 1 | 1988 | . |
| 171 | 2 | 65 | 1 | 1 | 2 | 1 | 2593 | . |
| 172 | 2 | 66 | 1 | 1 | 1 | 1 | 1523 | . |
| 173 | 2 | 64 | 1 | 1 | 1 | 1 | 2286 | . |
| 174 | 2 | 58 | 1 | 2 | 1 | 1 | 1850 | . |
| 175 | 2 | 88 | . | . | . | . | 492 | 3 |
| 176 | 2 | 84 | . | . | . | . | 167 | 2 |
| 177 | 2 | 82 | . | . | . | . | 1750 | 0 |
| 178 | 2 | 79 | . | . | . | . | 1980 | 2 |
| 179 | 2 | 79 | . | . | . | . | 2723 | 3 |
| 180 | 1 | 79 | . | . | . | . | 1383 | 2 |
| 181 | 2 | 79 | . | . | . | . | 2045 | 2 |
| 182 | 2 | 77 | 1 | 2 | 2 | 3 | 1579 | . |
| 183 | 2 | 77 | . | . | . | . | 1699 | 5 |
| 184 | 1 | 72 | 1 | 2 | 2 | 1 | 2441 | . |
| 185 | 2 | 68 | 1 | 1 | 1 | 2 | 2035 | . |

For legends, see the previous page.

came from. Because it was matched only for age and sex, it is not known whether this group was initially in better general health and had better walking capacity at the starting point than the patients, and whether the differences between the groups were due to these circumstances. This does not seem very probable, however, because over 90 percent of the patients were more or less ambulatory at the time of fracture. Although all the controls would have been ambulatory at the starting point, which is extremely unlikely, the initial difference cannot explain the major difference between the groups at follow-up. The difference between survival curves is not either accounted for by the dissimilarity of the groups, for in such a case the curve of the patients would have been linear, with a different slope than that of the controls. On the contrary, there was a pronounced initial fall in the curve of the patients. Subsequently, the curves converged and had united by 5 years. It is evident that the fracture increased the mortality especially among those patients who were most seriously disabled, whereas those with a good general condition tolerated the trauma and lived as long as they would have had they not been traumatized.

The mortality rate of 15 percent after 3 months in our series was considerably lower than reported by Jensen and Holstein (1975) using Moore's arthroplasty (21 percent) and that reported by Stewart (1984) concerning Thompson's hemiprosthesis (36 percent). When the patients who underwent screw fixation are included, the 3-month mortality decreased to 13 percent; and this is within the range of mortalities reported by Jensen and Töndewold (1979), dealing both with trochanteric and cervical hip fractures, and Holmberg et al. (1986), concerning intracapsular femoral neck fractures treated by osteosynthesis. Very low 3-month mortality rates have also been observed in selected materials, such as 7 percent among patients with cervical hip fracture managed by internal fixation and admitted from their own homes (Holmberg et al. 1987). The 5-year mortality of 59 percent was on a parity with most studies on cervical hip fractures treated by osteosynthesis. Öhman et al. (1969) reported 56 percent, Holmberg et al. (1986) reported a 6-year mortality of 54 percent, Nilsson et al. (1988) reported 53 percent, but Beals (1972) reported 81 percent.

The period of increased mortality after the fracture varies considerably between reports. Alffram (1964) found that the cumulative mortality became the same as that of the general population at 3 months and Holmberg et al. (1986) at 12 months. In the material of Jensen and Töndewold (1979) this occurred after 19 months, a figure which comes very close to our finding of 18 months. The increment in mortality was highest at that point, being 21 percent. This figure seems to characterize the mortality associated with the treatment better than does the total mortality figures at different points in time.

Our result are in agreement with earlier reports in which a higher mortality rate has been observed in patients admitted from institutions than in those coming from their own homes (Jensen 1984, Holmberg and Thorngren 1987), and a higher rate in males than in females (Holmberg et al. 1986, Holmberg and Thorngren 1987).

The proportion of patients admitted from their own homes, 50 percent, was of the same order as that reported by Ceder et al. (1987). Much higher percentages have been found, however, e.g., the 79 percent reported by Holmberg and Thorngren (1985). These figures reflect the organization of homes for the elderly in catchment areas of different hospitals. Our figure is also reduced by the absence of the youngest patients from the material; including those, it increased to 56 percent. At the end of the present survey, 37 percent of the patients were living independently, and 60 percent of the patients admitted from their own homes. This is notably less than the 80 percent reported by Nilsson et al. (1988) in patients treated by osteosynthesis, but documentation is incomplete on this point in papers concerning hemiarthroplasty. A comparison of the patients with their controls is not possible in this respect because it is not known where the controls were living at the time when the fracture occurred in the patients.

Function has gained only limited attention in the series concerned with femoral neck fracture treated by hemiarthroplasty. Montgomery and Lawson (1978) reported markedly reduced function in 35 percent of their 94 patients 5 years after fracture treated with Thompson endoprosthesis without cement. In the present series the locomotor ability of the patients after a somewhat longer observation period was considerably worse, 53 percent being unable to move about independently as compared with only 12 percent of the controls. The difference may be partly due to the higher age of the patients at follow-up, but mainly results from the function of the hemiprosthetic hip. The reduced walking capacity impaired the quality of life of the patients considerably and was clearly the main reason for the institutionalization. We cannot be satisfied with our results in this respect.

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