

Occupational capacity after hip replacement

Working capacity and dependence on the social welfare system were analyzed in 387 patients 5 years after hip replacement. Significant pre-operative factors were age, etiology of the hip disease and walking ability, and at the follow-up age, walking ability, pain and subjective experience of satisfaction with the operation.

Among patients working pre-operatively, 92 per cent kept on working, and 70 per cent of patients on sick-leave went back to work. Only 9 per cent of patients working or sick-listed pre-operatively became invalidity pensioners, but none who were pensioners pre-operatively went back to work.

**J. Steen Jensen
Bent Mathiesen
Niels Tvede**

University of Copenhagen
Departments of Orthopaedic
Surgery T-2 & T-3 and Physical
Rehabilitation U, Gen-
tofte Hospital, Hellerup,
Denmark

Correspondence: Department of Orthopaedic Surgery U-2162, Rigshospitalet, DK-2100 Copenhagen Ø, Denmark

The importance of hip replacement for future working capacity or dependence on the social welfare system has received only slight attention (Kromann-Andersen & Jørgensen 1980, Olsson et al. 1979, Simesen 1980). In these series, 15-48 per cent of patients were at work pre-operatively, but only half of these kept on working postoperatively. Around 30 per cent received invalidity pensions at the time of operation and none of those returned to work.

The purpose of this study was to describe the effect of hip replacement on the occupational capacity, as this seems to be a more relevant measure for success in younger patients than hip mobility and walking ability.

Patients and methods

During the 8-year period April 1971 to March 1979, a total of 640 patients were admitted for treatment of hip disease, including osteoarthritis, rheumatoid arthritis, femoral head necrosis, etc. Total hip replacement was performed in 470 patients with a median age of 67 (21-89) years.

With a median follow-up time of 5 (2-11) years, 411 surviving patients were asked to complete a questionnaire covering the time prior to operation and at follow-up, including the variables: pain and need for analgesic, walking distance and -aids, residence and occupation, as well as a subjective evaluation of the result of surgery. Demographic variables like age, sex, complications to the surgery, year

of operation and department as well as the survival rate were also included in the study. A total of 94 per cent filled in the questionnaire by themselves or with the help of relatives or acquaintances; 336 of these 387 patients had been operated for primary osteoarthritis.

The occupational capacity was evaluated in relation to the Danish welfare system. The patients were divided into four groups: (a) working, (b) sick-listed, (c) receiving invalidity pension, i.e. a working capacity reduced by at least 50 per cent, and (d) retired because of age, including also individuals above 55 years with at least 50 per cent reduced working capacity in combination with other social factors (widows, low income, etc.); the scheduled age for retirement pension in Denmark is 67 years.

The data from the questionnaire and the demographic variables were analyzed with the aid of multidimensional contingency tables and graphical models (Edwards & Kreiner 1983). For supplementary statistical analysis, either the chi-square or the Gamma-tests were applied.

Results

The pre-operative occupational capacity was clearly related to age and sex (Table 1); 54 per cent of patients under 60 years of age were working, 19 per cent were sick-listed, and 27 per cent were receiving a pension. In accordance with the social welfare system, the vast majority above 70 years of age were pension-

Table 1. Pre-operative occupational capacity in relation to age and sex in patients with hip replacements

	Working	Sick-leave	In- validity pension	Age	Total
Age ^a					
-60	53	19	22	5	99
61-70	44	29	19	70	162
71-75	5	2		76	83
76-80				38	38
81-90				5	5
Sex ^a					
Males	47	33	13	46	139
Females	55	17	28	148	248
Total	102	50	41	194	387

a. $P < 0.0005$, chi-square-test.

ers. One third of the males were working, as compared to one fifth of the females.

Hip diseases occurring in childhood were predominantly represented among patients receiving invalidity pension pre-operatively.

The pre-operative occupational capacity was related to walking ability (Table 2). Among working patients, less need for supports and less reduction of the walking distance were noted. Among pensioners, the walking ability was seriously affected in only half of the patients. It is, however, quite remarkable that the pre-operative occupational capacity was

Table 2. Occupational capacity before and 5 years after hip replacement in relation to walking ability

	Working	Sick-leave	In- validity pension	Age	Total
Walking aids preoperatively ^a					
None/1 cane	85	34	24	134	277
2 canes/frame	13	10	15	46	84
Not walking	4	6	2	14	26
Walking aids at follow-up ^a					
None/1 cane	117	10	34	188	349
2 canes/frame	2		10	22	34
Not walking			1	3	4
Walking distance preoperatively ^a					
0-100 m	32	26	23	105	186
-500 m	44	10	11	54	119
>500 m	26	14	7	35	82

a. $P < 0.0005$, Gamma-test.

only weakly related to pain ($P = 0.054$); the determining variable in the graphical analysis proved to be age.

After total hip replacement, 92 per cent of patients under retirement age continued to work and two-thirds of sick-listed patients returned to their work (Table 3). At the 5-year follow-up only 7 per cent of pre-operatively working patients and 13 per cent of those sick-listed had become invalidity pensioners. The most striking feature is, however, that no patient gave up the invalidity pension and returned to work.

The working capacity at follow-up was analyzed in relation to all variables included in the study. Age obviously influenced the ability to work ($P < 0.0005$), but 34 per cent of patients under 60 years received a pension. Dependence on walking aids dominated among invalidity pensioners (Table 2), but the postoperative walking distance did not affect the result as such, because of interactions from needs for support or the pre-operative working capacity ($P = 0.29$ and 0.22).

In contrast to the pre-operative situation, the experience of pain affected the working capacity at follow-up ($P < 0.0005$), as 87 per cent of those working had no pain at all. The striking feature is that about half of the invalidity pensioners claimed to have severe pain, as compared to 14 per cent of old age pensioners and only 6 per cent of persons actively at work. About 85 per cent of invalidity pensioners and sick-listed patients did not experience improvement of the pre-operative pain, as compared to 8 per cent of old age pensioners and only one patient at work.

Table 3. Occupational capacity before and 5 years after hip replacement

	Before				
	Working	Sick-leave	In- validity pension	Age	Total
Working	91	28			119
Sick-leave	1	7	1	1	10
Invalidity pension	7	5	33		45
Age-pension	3	10	7	193	213
Total	102	50	41	194	387

The vast majority of working people (97 per cent) and elderly pensioners (88 per cent) were satisfied with the total hip replacement, but 40 per cent of the invalidity pensioners were dissatisfied.

Discussion

Total hip replacements were earlier restricted to older persons because of uncertainty about the duration of the beneficial clinical results. The demands on function and improvement of pain and walking ability in short-term observations have, however, resulted in the previously applied hip surgery (i.e. fusion or osteotomy) being superseded by total hip replacement even in younger patients. In our opinion this decrease in age makes a comprehensive description of the results even more important; it should emphasize the maintenance or improvement of the working capacity and living conditions as well as the patients' own opinion about the result.

The most striking feature of the pre-operative situation was a clear relationship between the occupational capacity and walking ability. In the present series nothing is known about the different types of occupation; this obviously needs further elucidation, as has been attempted by Kromann-Andersen & Jørgensen (1980).

No patient in this series gave up a social pension and resumed work, a point also made previously (Kromann-Andersen & Jørgensen 1980). In the present series this is rather surprising, especially for the younger patients. Further clarification is needed as to whether the younger persons with walking disabilities are more dissatisfied with the total hip replacement and do not improve significantly in the usual clinical follow-up variables. This, however, was not the finding in a number of clinical series (Bisla et al. 1976, Dorr et al. 1983, Halley & Charnley 1975), and might lead to the suggestion that instead of attempting to solve the social and occupational problems by an invalidity pension, total hip replacement should be performed as soon as indicated, followed by attempts at social rehabilitation, as also proposed by Löfmark & Rydell (1984). We

realize that the present high rate of unemployment does not stimulate the patients to such experiments, but for the benefit of the social system, and especially the patients' future quality of life, such attempts should be made.

The last observation from this study was a clear connection between the occupational capacity and the subjective postoperative experience of pain, pain-relief and walking ability, which is fairly understandable and obviously also related to the pre-operative situation. The explanation for pain as a significant variable postoperatively might be unfulfilled expectations from the patients (Löfmark & Rydell 1984).

Further investigations on the social effect of total joint arthroplasties are needed, and some changes in attitude to the patients may be indicated.

Acknowledgements

Gratitude is expressed to Rigsforeningen til Gigtens Bekæmpelse for financial support. The statistics were contributed by Svend Kreiner, cand. stat., Department for Data Processing, Copenhagen County Hospitals.

References

- Bisla, R. S., Inglis, A. E. & Ranawat, C. S. (1976) Joint replacement surgery in patients under thirty. *J. Bone Joint Surg.* **58-A**, 1098–1104.
- Dorr, L. D., Takei, G. K. & Conaty, J. P. (1983) Total hip arthroplasties in patients less than forty-five years old. *J. Bone Joint Surg.* **64-A**, 474–479.
- Edwards, D. & Kreiner, S. (1983) The analysis of contingency tables by graphical models. *Biometrika* **70**, 553–565.
- Halley, D. K. & Charnley, J. (1975) Results of low friction arthroplasty in patients thirty years of age and younger. *Clin. Orthop.* **112**, 180–191.
- Kromann-Andersen, C. & Jørgensen, K. (1980) Nogle sociale aspekter for patienter før og efter hoftealloplastik a. m. Charnley. *Ugeskr. Læger* **142**, 1816–1819.
- Löfmark, C. & Rydell, N. (1984) Både individ och samhälle tjänar på tidig operation av höftledsplastiker. *Läkartidn.* **81**, 2492–2493.
- Olsson, S. S., Jernberger, A. & Tryggvø, D. (1979) Total hip replacement by the Muller-Charnley prosthesis. *Acta Orthop. Scand.* **50**, 457–463.
- Simesen, K. (1980) Total hip replacement ad modum Ring. *Acta Orthop. Scand.* **51**, 929–935.