

# Recovery of physical function and patient's satisfaction after Total Hip Replacement (THR) surgery supported by a tailored guide-book

*Mattia Fortina, Serafino Carta, Dario Gambera, Edoardo Crainz, Paolo Ferrata, Pietro Maniscalco*

Department of Orthopaedics and Traumatology, University Hospital of Siena, Siena, Italy

**Abstract.** *Background and aim of the work:* The purpose of this prospective study was to give a customized guide, describing the hospitalization period and the postoperative exercise program, to patients scheduled for total hip arthroplasty (THA) and to show its effectiveness on functional recovery and on patient's satisfaction with the rehabilitation care and with the in-hospital discharge planning after surgery. *Methods:* This trial included 365 consecutive subjects with osteoarthritis who underwent THA at the Orthopaedic and Traumatology Clinic of Siena (Italy). The Harris Hip Score (HHS), a disease specific measure, was determined before and after surgery. Postoperative evaluations, associated with a Satisfaction Questionnaire, were carried out at the time of discharge and after 3 months. *Results:* The overall satisfaction level was very high, both at discharge ( $81\pm 28$ ) and at follow-up ( $90\pm 17$ ). The HHS results showed a significant ( $p\leq 0.05$ ) improvement over time in patients with higher scores 3 months after surgery in comparison with baseline. *Conclusions:* Patients reported high levels of satisfaction at the 3 month postoperative follow-up and good levels at discharge. After surgery, the highest improvements were shown in bodily pain and physical function scores. The current study showed that a customized guide was well accepted by patients with THA and satisfied their need of information. It was also effective in improving patient's satisfaction and early recovery of physical function after surgery. ([www.actabiomedica.it](http://www.actabiomedica.it))

**Key words:** THA, guide-book, rehabilitation, patient's satisfaction, exercise

## Introduction

The constant search for a better quality of life and the possibility of ending a chronic painful condition leads more and more people to undergo total hip replacement (THR) surgery. Medical, economic and social developments have resulted in an increasing number of THRs performed every year. Over one million total hip arthroplasties are implanted every year in the World (1).

THR is nowadays one of the most successful operations with the best cost-effectiveness ratio (2) and with the highest improvements in pain reduction and physical function recovery (3-5).

New technologies in surgery and anaesthesia and

an innovative rehabilitation led to a shorter hospitalization (6, 7). Consequently the patient should be able to reach high levels of physical activity as soon as possible and should be able to resume the activities of daily life quickly and effectively.

The decreased length of hospitalization reduces the available time for the specialized care team to educate patients. They need information both before and after hospitalization about the disease, the treatments, and what changes in their life will occur after surgery.

Patient education at discharge becomes very important in order for the patient to manage self care after the operation. A considerable number of patients lack knowledge about the rules they have to follow during rehabilitation (6).

Patient are often wrongly informed about surgery and outcome by their family and friends or by the media.

Since patients may forget or misunderstand spoken information given by the surgeon, they should psychologically benefit from a preoperative booklet that enhances their understanding about surgery, its complications and rehabilitation (8, 9).

Since January 1999 every patient undergoing THR at our Institution received a guide-book describing the hospitalization period and the postoperative exercise program. The guide also gives advice on how to restore the patient's ability to take care of himself.

The aim of this prospective study is to evaluate the patient's overall judgement of surgery in terms of satisfaction. We analyze the patient's satisfaction with the rehabilitation program and the discharge planning after THR surgery. Changes in pain and function, important determinants of patient's satisfaction with THR, are also evaluated.

## Materials and methods

Patients undergoing primary THR surgery for osteoarthritis, between January 1999 and December 2003 were enrolled in the study. Patients with previous hip joint arthroplasty, or patients with a femoral neck fracture, a congenital dysplastic hip or with severe comorbidity and psychological dysfunction were excluded from this study.

The data were prospectively collected and were not taken from medical records.

Patient was placed during surgery in the lateral decubitus position and the Bauer's direct lateral approach was used.

Every patient received an uncemented prosthesis and was treated for 4-5 weeks with low-molecular-weight heparin to prevent thrombo-embolic problems.

The primary outcome measure was a satisfaction questionnaire, specifically developed for this study, filled out at discharge and at the three-month follow-up examination by each patient. The subjective outcome was defined by the response to the six questions showed in table 1. The level of satisfaction was evaluated with a four point Likert scale (A = not at all,

**Table 1.** The Satisfaction Questionnaire

- 
1. Has the operation increased function and daily activity?
  2. Has the operation decreased hip pain?
  3. Are you satisfied with the surgery outcome?
  4. Are you satisfied with the in-patient (at discharge)/home based (at 3 months follow-up) rehabilitation program?
  5. Are you satisfied with the in-hospital discharge planning?
  6. Are you satisfied with the information received?
- 

B = not much, C = enough, D = very much). The results were normalized to produce a total score between zero and 100, with higher scores representing greater satisfaction.

The secondary outcome measure was the Harris Hip Score (HHS) (10) that was determined before (baseline examination) and after surgery. Postoperative evaluations were carried out at discharge and after 3 months.

In addition we asked who had read the guide.

### *The Guide-book*

The guide that was given to all patients is divided into five chapters.

The first chapter gives general information about the Hospital, i.e. telephone numbers.

Pathologies that could require a THR are described in the second chapter. Total hip arthroplasty and a short description of the operation procedure are also explained in this chapter.

The third chapter emphasizes the importance of a correct diet to prevent weight gain and subsequent prosthesis overload.

The fourth chapter describes the hospitalization period day by day from admission to discharge, and the rehabilitation functional milestones are underlined.

The last chapter describes both the exercise program that the patient will follow during inpatient rehabilitation and the home based training program. Moreover recommendations and advice on what patients can or cannot do are also given for a safe recovery of the normal and recreational activities of daily life (11, 12). We encourage patients to remain physically active for their general health and to increase bo-

ne quality which improves prosthesis fixation and decreases the incidence of early loosening.

### *Exercise Program*

Since the second postoperative day, the inpatient exercise session is approximately of 30 minutes every morning with a 15-minute aerobic and strength program followed by a 15-minute program of mobility and gait retraining. The patient is encouraged to exercise by himself also in the afternoon, following the exercises described in the guide.

Active and passive kinesitherapy is individually performed to strengthen and stretch the muscle mass and to recreate regular joint mobility.

The program includes resistance exercises like heel raising, leg flexion and extension, thigh flexion and extension, isometric thigh abduction and extension. Specific exercises improve also trunk strength.

Exercise programs begin with one set of 10 repetitions, increasing to three sets of 10 repetitions as soon as the patient improves.

The patient is trained to walk with two crutches reciprocally placed with weight-bearing as tolerated (13, 14).

Each patient is given instructions for an individual rehabilitation program to be continued after discharge which includes strengthening and stretching of the pelvic girdle muscles and deambulation with two crutches alternatively placed for at least two-three weeks. We suggest to leave one crutch only if the patient does not show the Trendelenburg sign. An early use of only one crutch can cause an erroneous deambulation with incorrect weight distribution, on the healthy side and reduced bearing time on the operated side which leads to a limp.

### *Statistical Analysis*

Distribution of the variables was calculated as mean, standard deviation (SD) and range, the *t* test for paired (patient dependent) data was used, to examine the changes in scores between baseline and follow-up examinations. The statistical threshold was set at  $p \leq 0.05$ , to evaluate the change levels.

Statistical analysis was performed using Statistical Packages for the Social Sciences (SPSS) software, version 10 for Windows.

## **Results**

During the five-year study period, out of the 654 total hip replacements were performed in our institution, 377 patients (57.6%) were enrolled in this study. Twelve of them were lost at follow-up. The prospective results of this study were based on 365 patients with complete preoperative and postoperative evaluations.

The mean age of this sample was 64 years (range: 47-80 years), 153 men (42%) and 212 (58%) women. No intraoperative complications occurred, only 1 patient developed a deep vein thrombosis 21 days after surgery.

The results of the Satisfaction Questionnaire are shown in table 2. The overall satisfaction level was very high, both at discharge ( $81 \pm 28$ ) and at follow-up ( $90 \pm 17$ ).

The HHS results showed a significant ( $p \leq 0.05$ ) improvement over time in patients with higher scores 3 months after surgery in comparison with baseline. Data are shown in table 3.

Two hundred ninety patients (79.5%) read the guide during the hospitalization period; at the follow-up control 340 patients (93.3%) had read the guide.

## **Discussion**

Hip replacement is a major surgical procedure which can be physically and psychologically stressful for patients. Several works hypothesize that the education of patients undergoing THR reduces anxiety and enhances postoperative outcomes (15-18).

Johansson et al (19) emphasize that patients need information about their disease, its treatment and complications both before and after surgery. Macario et al analyze what specific information patients want to know (20).

The current prospective study examined the impact of a customized guide on patients' satisfaction after primary total hip arthroplasty.

**Table 2.** The Satisfaction Questionnaire: discharge and 3 months follow-up evaluation

The Satisfaction Questionnaire	Discharge				3 months follow-up			
	A	B	C	D	A	B	C	D
1. Has the operation increased function and daily activity?	35 9.6%	158 43.3%	152 41.6%	20 5.5%	0	0	44 12.1%	321 87.9%
2. Has the operation decreased hip pain?	0	62 17.0%	181 49.6%	122 33.4%	0	8 2.2%	53 14.5%	304 83.3%
3. Are you satisfied with the surgery outcome?	0	31 8.5%	151 41.4%	183 50.1%	0	0	21 5.8%	344 94.2%
4. Are you satisfied with the in-patient (at discharge)/home based (at 3 months follow-up) rehabilitation program?	0	61 16.7%	190 52.1%	114 31.2%	0	52 14.2%	140 38.4%	173 47.4%
5. Are you satisfied with the in-hospital discharge planning?	0	0	86 23.6%	279 76.4%	0	0	73 20.0%	292 80.0%
6. Are you satisfied with the information received?	0	0	59 16.2%	306 83.8%	0	0	30 8.2%	335 91.8%

Note: letters mean A = not at all, B = not much, C = enough, D = very much

**Table 3.** Changes in patient's outcome: from baseline to the end of the study

	Baseline	Discharge	3 month follow-up
HHS	42.1/15.6 (15-76)	74.8/18.1 (41-95)	90.2/13.2 (65-100)
HHS			
Excellent	0%	11 (3.0%)	312 (85.5%)
Good	0%	35 (9.6%)	42 (11.5%)
Fair	76 (20.8%)	224 (61.4%)	9 (2.5)%
Poor	289 (79.2%)	95 (26.0%)	2 (0.5%)

Note: values are mean/SD (range)

We described the patients' perceived satisfaction with regards to both surgery and the rehabilitation program, using qualitative and quantitative methods.

A high number of patients read the guide, especially after discharge, when they felt better and had more time to read.

Patients reported high levels of satisfaction at the 3 month postoperative follow-up and good levels at discharge.

After surgery, the highest improvements were in body pain and physical function scores. Improvement in these scores could also lead to improvements in social function, mental health and vitality (21).

We did not obtain negative records at discharge

or after three months, concerning satisfaction with the hospital discharge planning and with the information given. Nobody, after three months, was unsatisfied with the results of the operation and with the level of activity reached. Our results also suggested that the guide provided almost all the information the patient needed and it contributed to improve the satisfaction level perceived by the patient.

The worst records were seen in the perceived satisfaction with rehabilitation, both with inpatient and home-based programs, because patients would like to spend more time with their physiotherapist. The aim of the postoperative rehabilitation program is to restore the entire articular range of movement (ROM) and complete muscular activity. The ROM is often wide after a THR, instead muscles are always weak because of the pathology and the surgical trauma. It is important to start with an early rehabilitation program to restore pelvic girdle muscle strength and abdominal and erector spine muscle strength, since they control the anterior-posterior balance of the pelvis during deambulation in association with the glutei. Patients might understand the importance of this in association with the glutei rehabilitation program, since the stability of their new articulation and a correct deambulation depends on their muscular strength.

Selection bias was introduced through the exclusion of severely ill patients. A limitation of our work was due to the absence of a control group. Furthermore did not evaluate the real adherence to the in-patient rehabilitation and to the home based program, because it was not our primary objective.

With reference to the ongoing trend of reducing hospital stays, we believe, in accordance with other authors (22, 23), that it is also becoming very important to instruct family and friends on how to provide social support at home. A customized guide can improve the quality of social support and fulfill the patient's needs with a positive effect on health, functioning and postoperative recovery. Further studies are needed to obtain reliable conclusions on the effectiveness of a guide for family and friends of patients who underwent THR.

## References

1. American Academy of Orthopaedic Surgeons: National Center for Health Statistics. Rosemond IL, American Academy of Orthopaedic Surgeons 1999, 14.
2. Maynard A. Developing the health care market. *Econ J* 1991; 101: 1277-86.
3. Shields RK, Enloe LJ, Leo KC. Health related quality of life in patients with total hip or knee replacement. *Arch Phys Med Rehabil* 1999; 80: 572-9.
4. Ethgen O, Bruyere O, Richy F, Dardennes C, Reginster JY. Health-related quality of life in total hip and total knee arthroplasty. A qualitative and systematic review of the literature. *J Bone Joint Surg Am* 2004; 86-A(5): 963-74.
5. Boutron I, Poiraudou S, Ravaud P, et al. Social and personal consequences of disability in adults with hip and knee arthroplasty. A French national community based survey. *J Rheumatol* 2004; 31 (4): 759-66.
6. Stevens M, van den Akkee-Scheek I, Spriensma A, Boss NAD, Diercks RL, van Horn JR. The Groningen Orthopaedic Exit Strategy (GOES): a home-based support program for total hip and knee arthroplasty patients after shortened hospital stay. *Pat Edu Cons* 2004; 54: 95-9.
7. Ganz SB, Wilson Jr PD, Cioppa-Mosca J, Peterson MGE. The day of discharge after total hip arthroplasty and the achievement of rehabilitation functional milestones. *J Arthroplasty* 2003; 18 (4): 453-7.
8. Gammon J, Mulholland CW: Effect of preparatory information prior to elective total hip replacement on post-operative physical coping outcomes. *Int J Nurs Stud* 1996; 33: 589.
9. Giraudet-Le Quintrec JS, Coste J, Vastel L, et al. Positive effect of patient education for hip surgery: a randomized trial. *Clin Orthop* 2003; 414: 112-20.
10. Harris WH. Traumatic arthritis of the hip after dislocation and acetabular fractures: tractament by mold arthroplasty. An end-result study using a new method of resolt evaluation. *J Bone Joint Surg Am* 1990; 72: 161-8.
11. Ganz SB, Levin AZ, Peterson MG, Ranawat CS. Improvement in driving reaction time after total hip arthroplasty. *Clin Orthop* 2003; 413: 192-200.
12. Kuster MS. Exercise recommendations after total joint replacement. A review of the current literature and proposal of scientifically based guidelines. *Sports Med* 2002; 32 (7): 433-45.
13. Andersson L, Wesslau A, Bodén H, Dalén N. Immediate or late weight bearing after uncemented total hip arthroplasty. A study of functional recovery. *J Arthroplasty* 2001; 16 (8): 1063-5.
14. Woolson ST, Adler NS. The effect of partial or full weight bearing ambulation after cementless total hip arthroplasty. *J Arthroplasty* 2002; 17 (7): 820-5.
15. Mc Gregor AH, Rylands H, Owen A, Doré CJ, Hughes SPF. Does preoperative hip rehabilitation advice improve recovery and patient satisfaction? *J Arthroplasty* 2004; 19 (4): 464-8.
16. Fielden JM, Scott S, Horne JG. An investigation of patient satisfaction following discharge after total hip replacement surgery. *Orthop Nurs* 2003; 22 (6): 429-36.
17. Grissom SP, Dunagan L. Improved satisfaction during inpatient rehabilitation after hip and knee arthroplasty: a retrospective analysis. *Am J Phys Med Rehabil* 2001; 80 (11): 798-803.
18. McDonald S, Hetrick S, Green S. Pre-operative education for hip or knee replacement. *Cochrane Database Syst Rev* (1): CD003526, 2004.
19. Johansson K, Hupli M, Salanterä S. Patients' learning needs after hip arthroplasty. *J Clin Nurs* 2002; 11: 634-9.
20. Macario A, Schilling P, Rubio R, Bhalla A, Goodman S. What questions do patients undergoing lower extremity joint replacement surgery have? *BMC Health Services Research* 2003; 3: 11.
21. March LM, Cross MJ, Lapsley H, et al. Outcomes after hip or knee replacement surgery for osteoarthritis. *MJA* 1999; 171: 235-8.
22. Mahomed NN, Koo Seen Lin MJ, Levesque J, Lan S, Bogocho ER. Determinants and outcomes of inpatient versus home based rehabilitation following elective hip and knee replacement. *J Rheumatol* 2000; 27: 1753-8.
23. van den Akkee-Scheek I, Stevens M, Spriensma A, van Horn JR. Groningen Orthopaedic Social Support Scale: validity and reliability. *J Adv Nurs* 2004; 47 (1): 57-63.

Accepted in: 14 December 2005

Correspondence: Dr. Mattia Fortina, M.D.

Viale Bracci, 1

53100 Siena (Italy)

Tel. +390577585675

Fax +390577233400

E-mail: tia1974@katamail.com