European Journal of Orthopaedic Surgery & Traumatology (2019) 29:91–95
https://doi.org/10.1007/s00590-018-2243-6

ORIGINAL ARTICLE • HIP - ARTHROPLASTY

No decline in high patient satisfaction after total hip arthroplasty at long-term follow-up

P. P. Schmitz[1] · J. L. C. van Susante[1] · A. Hol[1] · R. Brokelman[2] · C. J. M. van Loon[1]

Received: 28 February 2018 / Accepted: 25 May 2018 / Published online: 1 June 2018

Abstract

Introduction Patient satisfaction is gaining popularity as an important outcome parameter in today's healthcare system and in particular in evaluating the outcome of joint arthroplasty. Total hip arthroplasty (THA) is a very successful procedure with reports on high patient satisfaction at short-term follow-up. Commonly used clinical outcome parameters remain good at long-term follow-up; however, whether this also accounts for patient satisfaction remains unclear. This study presents a prospective follow-up of patient satisfaction after THA, and a possible correlation with common outcome parameters was established.

Methods This study entails a concise follow-up of an earlier study on patient satisfaction 2.5 years after THA. Patient satisfaction was repeatedly measured with a visual analogue scale (VAS) after a mean follow-up of 13.5 (12.6–14.2) years in a prospective cohort of 147 patients (153 THAs). In addition, VAS pain and common clinical outcome parameters (WOMAC, OHS and SF-36) were also reassessed and were compared with short-term results after a mean follow-up of 2.5 (1.3–3.0) years.

Results At a follow-up of 13.5 (12.6–14.2) years, the median VAS for satisfaction was 95 (26–100) compared to a median VAS satisfaction of 98 (0–100) at earlier follow-up ($p = 0.781$). Overall, the clinical outcome parameters also remained good at long-term follow-up without significant changes. However, a rather low correlation with VAS satisfaction was encountered. Pain during activity showed the highest correlation (− 0.686) with VAS satisfaction.

Conclusion Patient satisfaction after THA remains high after prolonged follow-up. Apparently patients do not get used to the successful results of their THA. A rather low correlation with common clinical outcome parameters suggests that patient satisfaction is a separate entity. Since patient satisfaction correlated best with pain during activity, this is probably the most important aspect in patient satisfaction. Measurement of patient satisfaction has additional value and may even replace some of the more commonly used questionnaires.

Keywords Patient satisfaction · Long term · Total hip arthroplasty · VAS

Introduction

The efficacy of total hip arthroplasty (THA) can be evaluated with commonly used clinical outcome scores. In general, these outcome scores show good short- and long-term results after THA. Shared decision making and patient-centered care are important in today's healthcare system. Hence, in order to counsel patients, there is a high demand for patient-reported outcome measurements in treatment evaluation. The patient may express his/her satisfaction after surgery in various ways [1–7]. Patient satisfaction is a complex subjective feeling that depends on many different factors. It can be measured with just one question [1, 2], a four-point Likert scale [3] and a continuous scale [4–6]. Brokelman et al. [7] validated patient satisfaction, in a relatively simple way, with a numeric visual analogue scale from 0 to 10 (VAS).

Many studies have shown a good short-term (1–6 years) patient satisfaction after THA [1, 3–8]. Few studies evaluated patient satisfaction after THA with a long-term (13 years) follow-up [9, 10]. To the best of our knowledge, there is no data of prospective follow-up on patient

✉ C. J. M. van Loon
CvanLoon@rijnstate.nl

[1] Department of Orthopedics, Rijnstate Hospital, Wagnerlaan 55, AD 6815 Arnhem, The Netherlands

[2] Department of Orthopedics, Deventer Hospital, Deventer, The Netherlands

satisfaction using repeated measurements. Hence, the content of the relationship between short-term and long-term patient satisfaction after THA is unknown. Patients could get used to the successful situation after their THA and minor discomforts start to gain attention again. This habituation of people to quickly return to a relatively stable level of happiness after major positive events is called hedonic adaptation [11].

In Rijnstate Hospital, patient satisfaction using a VAS has been evaluated in a group of patients 2.5 years after their THA [7]. In the current study, a concise long-term follow-up was performed in the same group of patients. The purpose of this study was to evaluate whether the encountered high early patient satisfaction after THA would persist. We hypothesized from the phenomenon of hedonic adaptation that patient satisfaction would decline after prolonged follow-up.

In addition, correlation of patient satisfaction with common used outcome parameters was established.

Methods

The current study presents an update of a previously published cohort study on early patient satisfaction after THA [7]. The historical cohort consisted of 147 patients (153 hips) who underwent primary THA between October 2003 and June 2005 and who participated in the study of Brokelman et al. [7]. Approval from the local institution was obtained (No. 2017-1121).

As a start, the medical files of all 147 patients were reviewed. At an average follow-up of 13.5 years (range 12.6–14.2), 42 patients (44 hips) passed away. Seven patients (7 hips) were excluded, 5 because their THA had been revised and 2 because they suffered from advanced dementia.

Subsequently, questionnaires and patient information regarding this study were sent to the patients. Questionnaires consisted of repetition of the original VAS satisfaction [7], the VAS pain in rest and during activity [12, 13], the Western Ontario McMaster Universities osteoarthritis index (WOMAC) [14, 15], the SF-36 [16, 17] and the Oxford Hip Score (OHS) [18]. The VAS satisfaction consists of a 100-mm line. The beginning (left side) of the line represents no satisfaction, and the end (right side) represents extreme satisfaction. Patients were asked to make a vertical mark on the line that represented their present satisfaction concerning their THA. Patients were also asked if their THA had been revised in another hospital. Patients who did not respond initially were approached by phone. The response rate was 92%. In total, 91 patients (94 hips) were included (Fig. 1).

The results of the questionnaires 13.5 years after THA (T2) were compared with the results of Brokelman et al. [7] after 2.5 years (T1).

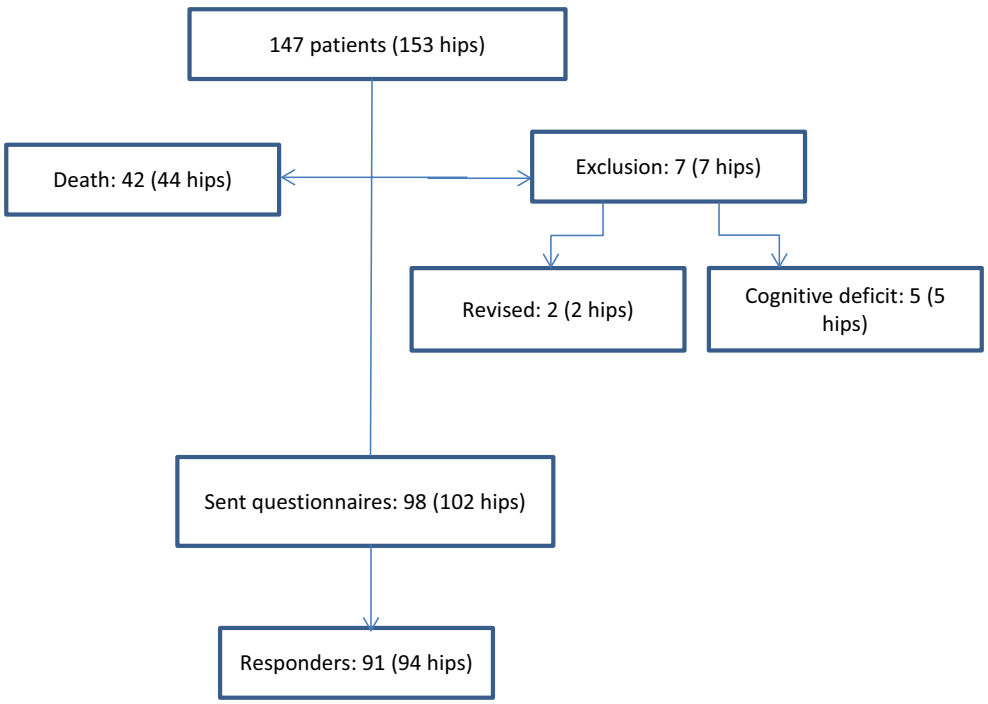

Fig. 1 Inclusion/exclusion

Statistical analyses

Statistical analysis was performed with SPPS 24.0 (SPSS Inc. Chicago, IL). The variables were checked for normal distribution by means of the Shapiro–Wilk test. Statistical significance was set at $p < 0.05$. Correlation was calculated with the nonparametric Spearman, and difference between T1 and T2 with the nonparametric Wilcoxon signed rank test.

Results

At the time of surgery, the mean age of the 91 patients (23% men) was 64.6 years (49–82). The left hip was replaced in 48 out of 94 cases. Indication for THA was osteoarthritis in 91 hips and osteonecrosis of the femoral head in 3 hips. A cemented THA (Charnley Elite Plus, DePuy/Johnson & Johnson, Leeds, UK) was performed in 32 patients, and 62 patients received an uncemented THA (Zweymüller, Zimmer, Winterthur, Switzerland).

Patient satisfaction was 95 (26–100) at T2. At T1, patient satisfaction was 98 (0–100). There was no significant difference between these two time intervals ($p = 0.781$).

Clinical outcome scores

VAS pain, both in rest and activity, and the Oxford Hip Score showed no significant changes with long-term follow-up. The WOMAC and the SF-36 both decreased significantly in time. As for the WOMAC, this decrease was largely due to the functioning subscale while subscales for pain and stiffness remained stable (Table 1). For the SF-36, both the physical and mental subscales decreased significantly.

Table 1 Clinical outcome scores after THA

	T1 (range)	T2 (range)	*p* value difference
VAS satisfaction	98 (0–100)	95.0 (26–100)	0.781
VAS pain rest	2.0 (0–67)	2.0 (0–70)	0.413
VAS pain activity	4.0 (0–80)	4.5 (0–82)	0.664
WOMAC pain	6.0 (4–17)	6.0 (3–23)	1.000
WOMAC stiffness	3.0 (2–10)	4.0 (2–9)	0.096
WOMAC functioning	24.0 (16–72)	27.0 (16–75)	0.015
WOMAC total	34.0 (23–89)	39.0 (22–103)	0.037
Oxford Hip Score	16.0 (12–42)	18.0 (12–49)	0.083
SF-36 physical	75.0 (5–100)	55.0 (0–100)	0.000
SF-36 mental	88.0 (32–100)	78.0 (12–100)	0.000

T1 = median (range) at 2.5 years, T2 = median (range) at 13.5 years

Correlation

Correlation of change in VAS satisfaction at T2 with change in the other outcome parameters was calculated. Correlations appeared to be rather low for all clinical scores with a highest correlation score of − 0.686 for VAS pain during activity (Table 2).

Discussion

In this prospective long-term follow-up study on patient satisfaction after THA, a stable high patient satisfaction level was encountered, up to a mean follow-up of 13.5 years.

In today's healthcare system, there is a high demand for measuring patient-reported outcome measurements with an increasing focus on patient satisfaction. Wylde et al. [19] have reviewed several common outcome measures after THA and concluded that patient satisfaction is often ignored compared to measures of health status and well-being. The literature shows good short- and long-term results regarding patient satisfaction after THA [1, 3–10, 20]. A systematic review of Shan et al. [20] describes outcome after THA in articles published between 2000 and 2012. In five of the studies, patient satisfaction is measured which showed "favorable satisfaction" up to 7 years of follow-up. In the current study, repeated quantitative measurements for patient satisfaction are used. Koutras et al. [21] have performed a systematic review of outcomes in a different group of patients namely after total hip resurfacing arthroplasty. Three studies in this meta-analysis have measured patient satisfaction with favorable results after a mean follow-up of 0.5–2.5 years. The differences with our study are not only the studied population but also the shorter follow-up.

It is remarkable that only a minority of the studies evaluated in these systematic reviews has used patient satisfaction as outcome measure. To optimize practice, outcome

Table 2 Correlation VAS satisfaction T2 with clinical outcomes T2

	VAS satisfaction T2	*p* value
VAS pain rest	− 0.634	0.000
VAS pain activity	− 0.686	0.000
WOMAC pain	− 0.543	0.000
WOMAC stiffness	− 0.448	0.000
WOMAC functioning	− 0.465	0.000
WOMAC total	− 0.496	0.000
Oxford Hip Score	− 0.564	0.000
SF-36 physical	0.291	0.004
SF-36 mental	0.313	0.002

Correlation: Spearman's rho

measurements including patient satisfaction should continuously be measured and checked [19].

No other prospective long-term follow-up of patient satisfaction after THA using repeated validated quantitative measurements is available so far. This study shows a consistently high patient satisfaction after THA with a satisfaction score of 98 (0–100) after a mean follow-up of 2.5 years and 95 (26–100) after a repeated mean follow-up of 13.5 years. Common clinical outcome scores also remained high in particular for pain relief. A decrease in WOMAC and SF-36 could still be detected; however, mainly from a decline both physical and mental functioning subscales, whereas no decline in the WOMAC subscales pain and stiffness occurred. Thus, the decline in SF-36 and total WOMAC score most likely can be explained from age-related physiological changes and not so much from implant-related factors. Irrespective of this decline in health status, patient satisfaction of their THA remained high [16]. In contrast to our hypothesis, no decline in patient satisfaction from hedonic adaptation could be established. Hence, patients do not tend to get used to the successful outcome of their THA.

Comparison of VAS satisfaction with commonly used clinical outcome scores as WOMAC, Oxford Hip Score and SF-36 showed low correlations. Apparently, patient satisfaction is a separate entity, which cannot be extrapolated from the commonly accepted clinical outcome scores. Patient satisfaction correlated best with VAS pain during activity. Therefore, pain during activity is probably the most important aspect in determining patient satisfaction. In our opinion, the VAS satisfaction is a simple and reliable outcome parameter to follow-up on patients with a THA and deserves a place next to or may even be able to replace some of the more commonly used measures.

The fact that patients that passed away were excluded and that 7 out of 98 patients were lost to follow-up remains a limitation of this study since one could hypothesize that these patients may have been less satisfied. There is, however, no reason to believe that deceased patients may have been less satisfied, and this limitation is typical for longer follow-up of any treatment in a group of older patients. This does not account for the 7 percent of patients who were irresponsive to the questionnaires. On the other hand, this percentage compares the acceptable with available literature on arthroplasty follow-up studies. In addition, there is no evidence that this group of hard to track patients shows less good results. On contrary, Matharu et al. [22] reported that patients, who were initially considered lost to follow-up, appeared eventually to be well-performing after they had been traced after all.

In conclusion, repeated follow-up revealed persistent high patient satisfaction after total hip arthroplasty. In contrast to our hypothesis, patients did not get used to the successful results after THA. This study may help to improve preoperative counseling of patients that satisfaction about their THA can be expected to remain. Patient satisfaction is a separate entity and may even replace some of the more commonly used more laborious questionnaires.

Compliance with ethical standards

Conflict of interest All authors declare that they have no conflict of interest.

Ethical standard The procedures followed were in accordance with the ethical standards of the institutional and/or research committee and with the 1964 Helsinki Declaration and its later amendments.

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