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Excellent early outcome after total hip arthroplasty

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Abstract

Background: Not all patients gain the same degree of improvement from total hip replacement and the reasons for this are not clear. Many investigators have assessed predictors of general outcome after hip surgery. This study is unique in its quest for the predictors of the best possible early outcome.

Methods: We prospectively collected data on 318 total hip replacements. Prior to surgery patient characteristics, demographics and co-morbidities were documented. Hip function and general health was assessed using the Harris Hip score (HHS) respectively. The HHS was repeated at three years. We took a maximal HHS of 100 to represent an excellent outcome (25 patients). Multiple logistic regression analysis was used to identify independent predictors of excellent outcome.

Results: The two strongest predictive factors in achieving an excellent result were young age and a high preoperative HHS ($p = 0.001$).

Conclusions: It was the young and those less disabled from their arthritis that excelled at three years. When making a decision about the timing of hip arthroplasty surgery it is important to take into account the age and pre-operative function of the patient. Whether these patients continue to excel however will be the basis of future research.

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Introduction

Total hip arthroplasty (THA) has been shown to provide both significant improvements in the quality of life to patients with hip arthritis [1] but also an excellent cost per Quality-Adjusted Life Year gain of half that seen in total knee arthroplasty [2]. Not all patients however gain the same degree of improvement and the reasons for this are not clear. Many investigators have assessed predictors of outcome after hip surgery [3-7]. This prospective study is unique in its quest for the predictors of the best possible early outcome.

Materials and methods

Between 2003 and 2011 a dedicated collected data prospectively on 318 consecutive unilateral THA. Ethics committee approval was obtained. Informed consent was taken in all cases. Data collected pre-operatively included patient age, sex, body mass index (BMI), smoking status, medical co-morbidities (presence of hypertension, coronary heart disease and diabetes), any use of non-steroidal anti-inflammatory drugs (NSAIDS) or aspirin, ASA grade (American Society of Anaesthesiologists), pre-operative haemoglobin (Hb) and level of social deprivation (based on the patient's home post-code). All of the operations were primary procedures and involved cemented acetabular and cemented femoral prostheses. All patients received prophylactic intravenous cephalosporins and the surgery was conducted in a theatre with laminar flow. They were all performed, or supervised, by a consultant orthopaedic surgeon using the approach most familiar to them. Cementing technique, rehabilitation and follow up

were identical for each patient. Outcome was assessed using two different assessment measures. The first was a joint specific measure – The Harris Hip Score (HHS). The HHS is an extended hip function evaluation, which assesses the patient's perception of pain, function, ability to undertake activities and range of hip motion. The score ranges from 0 to 100, with higher scores indicating increased perceived success and satisfaction [8]. We chose a post-operative HHS of 100 to indicate a patient's perception of excellent outcome. Data was collected pre-operatively and at three years of follow-up. Previous work has shown that HHSs plateau post-total hip replacement at around 18 months [1]. At 3 years therefore we would not expect our patients to see much more in the way of improvement.

Statistics

All data was recorded in Microsoft Excel format. The association between a HHS of 100 was tested by chi-squared or t-tests for each factor separately. For factors that gave significant results in these analyses, multiple logistic regression was then used to test for the effect of each factor adjusted for the others. A p value of < 0.05 was considered significant and < 0.001 highly significant.

Results

We reviewed 318 unilateral THAs performed within the six-year recording period. We defined an excellent outcome as a patient having a maximum HHS of 100. In our study 25 patients (8%) had a HHS of 100 at three years. The average age of all the study patients was 68.5 (SD 9.9) years. The average age for the patients with a HHS of 100 was 62.0 (SD 9.9). Highly significant independent predictors (p values < 0.001) of a HHS of 100 were; male sex, young age, low ASA grade, low body mass index, high pre-operative HHS, low deprivation levels and the absence of a history of hypertension or coronary disease (Table 1,2,3). Multiple logistic regression analysis identified a young age (p = < 0.001) and a high pre-operative HHS (p = 0.001) as the two most significant associations with an excellent outcome.

Table 1 Demographic variable significance of excellent outcome at three years

Variable	P value
Age	<0.001
Sex	0.039
BMI	0.010
Deprivation level	0.007

Table 2 Pre- operative variable significance of excellent outcome at three years

Variable	P value
Hypertention	0.006
Diabetes	0.27
Coronary Disease	0.005
Aspirin	0.29
NSAIDS	0.018
ASA Grade	<0.001
Preoperative Hb	0.09

Table 3 Pre-operative Assessment scores significance of excellent outcome at three years

Variable	P value
Preoperative HHS	<0.001

Discussion

The indications for THA are severe pain and disability, with accompanying radiological changes at the hip in patients where nonoperative treatment has failed or is futile [9]. It has previously been tradition for arthroplasty surgery to be delayed for as long as the patient can tolerate. This is probably a consequence of the paucity of historical long-term follow-up for joint replacements.

More recent research has questioned this belief with younger patients appearing to achieve better outcomes than their aged counterparts [3,10]. Fortin et al [11] suggested performing arthroplasty surgery earlier in the course of functional decline may be associated with better outcome. Lingard et al [12] demonstrated marked functional limitation, severe pain and a low mental health score before total knee arthroplasty were predictors of worse outcome. Patients with poor pre-operative walking distance are less likely to gain the same benefits from THA [13]. Of the 318 patients enrolled in this study the two most powerful predictors of an excellent outcome at three years (HHS of 100) were a high pre-operative HHS and a young age at the time of surgery. The HHS is an extended hip function evaluation, which assesses the patient's perception of pain, function, ability to undertake activities and range of hip motion. The score ranges from 0 to 100, with higher scores indicating perceived success and satisfaction. Marchetti et al [14] suggested that a HHS of 90-100 indicates an excellent result, 80-90 a good result, 70-80 a fair result and less than 70 a poor result. The HHS was initially designed to assess the outcome of arthroplasty on traumatic arthritis after hip dislocation and acetabular fracture [8]. It has subsequently been shown to be both a sensitive and specific marker of hip function. Soderman and Malchau [16] confirmed the HHS as having high validity and reliability when compared with other outcome scoring systems. A weakness of the HHS however is that it assumes a concordance of the views between the clinician and patient. Rothwell et al [17] illustrated how patients and clinicians can differ in their subjective importance of different elements in quality of life assessment. Whether a maximum score of 100 out of 100 truly represents excellence is debatable. Johanson et al [4] noted final outcome score assessments do not take into account clinical improvement from the base line. This could be seen as a weakness in this study. A standard was required; hence the arbitrary figure of 25 was selected. This produced 8% of patients who reported the best possible score from surgery. This itself is of significance when related to the patient's consent process. Only one patient in thirteen will express no complaints whatsoever at the three-year follow-up. As improvement in patient satisfaction is rare beyond eighteen months [1] any grievances are liable to remain. It was the younger patients and those less disabled from their arthritis who excelled in this study. This is invaluable information to use during the consent process. At three years follow-up patients can expect the best possible result from their hip arthroplasty when they are relatively young and were less disabled from their arthritis. This would imply surgery earlier in the disease may give better early results. What is not clear however is the long term results of hip arthroplasty at a young age.

Hilmarsson et al [18] demonstrated in the Swedish hip registry 10-year survivorship of only 64-67% for hip replacements in patients under 55 years. Callaghan [19] saw a 29% revision rate at 20-25 years after THR when less than 50 years old. This would imply that although young patients may get an excellent early result the overall lifespan of the replacement is likely to be less. The increased levels of activity and the subsequent wear seen in the younger age group may explain this. In total knee replacements however the converse is true. In a prospective study of 622 knees Brenkel and Elson [20] demonstrated a young age as an independent predictor of pain from a knee replacement at five years. The authors speculated this could have been due to the development of a pain syndrome secondary to multiple previous operations. This is an entity not normally seen in hip arthroplasty surgery. The overall improvement for hip replacements in the young may not be as great. In a health-status questionnaire MacWilliam et al [21] demonstrated for each 10- point increase in the preoperative score patients could expect at least a 6-point decrease in postoperative improvement. In summary, when making a decision about the timing of hip arthroplasty surgery it is important to consider the age and pre operative function of the patient. These are strong predictive factors in achieving an early excellent result at three years. Whether these patients continue to excel however is not known and will be the foundations of future research

Competing Interests

The authors declare that they have no competing interest

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Conflict of interest :None

References

1. Ng CY, Ballantyne JA, Brenkel IJ: Quality of life and functional outcome after total hip replacement. A five-year follow-up. *J Bone Joint Surg Br* 2007, 89(7):868-873.
2. Räsänen P, Paavolainen P, Sintonen H, Koivisto AM, Blom M, Ryyänen OP, Roine RP: Effectiveness of hip or knee replacement surgery in terms of quality-adjusted years and costs. *Acta Orthop* 2007, 78(1):108-115.
3. Nilsson A-K, Petersson IF, Roos EM, Lohmander LS: Predictors of patient relevant outcome after total hip replacement for osteoarthritis: a prospective study. *Ann Rheum Dis* 2003, 62:923-930.
4. Johanson NA, Abzug JM, Gallus CA, Charlson ME: Baseline function and comorbidity predict outcome in total hip arthroplasty. *UPOJ* 2009, 194.
5. Davis AM, Agnidi Z, Bradley E, Kiss A, Waddell JP, Gross AE: Predictors of functional outcome two years following revision hip arthroplasty. *J Bone Joint Surg Am* 2006, 88-A:685-691.
6. Cuschnaghan J, Coggon D, Reading I, Croft P, Byng P, Cox K, Dieppe P, Cooper C: Long-term outcome following total hip arthroplasty: A controlled longitudinal study. *Arthritis Rheum* 2007, 57(8):1375-1380.
7. Biring GS, Masri BA, Greidanus NV, Duncan CP, Garbuz DS: Predictors of quality of life outcomes after revision total hip replacement. *J Bone Joint Surg Br* 2007, 89-B(11):1446-1451.
8. Harris WH: Traumatic arthritis of the hip after dislocation and acetabular fractures: treatment by mold arthroplasty. An end-result study using a new method of result evaluation. *J Bone Joint Surg Am* 1969, 51:737-755.
9. British Orthopaedic Association: Total Hip Replacement. A guide to best practice. London: BOA; 2009.
10. Field RE, Cronin MD, Singh PJ: The Oxford hip scores for primary and revision hip replacement. *J Bone Joint Surg Br* 2005, 87-B(5):618-622.
11. Fortin PR, Penrod JR, Clarke AE, St-Pierre Y, Joseph L, Belisle P, Liang MH, Ferland D, Phillips CB, Mahomed N, Tanzer M, Sledge C, Fossel AH, Katz JN: Timing of total joint replacement affects clinical outcomes among patients with osteoarthritis of the hip or knee. *Arthritis Rheum* 2002, 46(12):3327-3330.
12. Lingard EA, Katz JN, Wright EA, Sledge CB: Kinemax Outcomes Group. Predicting the outcome of total knee arthroplasty. *J Bone Joint Surg Am* 2004, 86-A:2179-2186.
13. Röder C, Staub LP, Egli S, Dietrich D, Busato A, Müller U: Patients with poor preoperative walking capacity and hip flexion are less likely to achieve an optimal outcome with regard to walking and motion. *J Bone Joint Surg Am* 2007, 89:11-17.
14. Marchetti P, Binazzi R, Vaccari V, Girolami M, Norici F, Impallomeni C, Commessatti M, Silvello L: Long-term results with cementless Fitek (or Fitmore) cups. *J Arthroplasty* 2005, 20(6):730-737.
15. Hoeksma HL, Van den Ende Ronday, Heering A, Breedveld FC, Dekker J: Comparison of the responsiveness of the Harris Hip Score with generic measures for hip function in osteoarthritis of the hip. *Ann Rheum Dis* 2003, 62:935-938.
16. Soderman P, Malchau H: Is the Harris hip score system useful to study the outcome of total hip replacement? *Clin Orthop Relat Res* 2001, 384:189-97.
17. Rothwell PM, McDowell Z, Wong CK, Dorman PJ: Doctors and patients don't agree: cross sectional study of patients' and doctors' perceptions and assessments of disability in multiple sclerosis. *BMJ* 1997, 314:1580-1583.
18. Hilmarsson S, Soderman P, Herbert P, Malchau H: An epidemiological analysis of a young total hip replacement population in Sweden. *J Bone Joint Surg Br* 2006, 88-B:S1, 47-48.
19. Callaghan JJ, Forest EE, Olejniczak JP, Goetz DD, Johnston RC: Charnley total hip arthroplasty in patients less than fifty years old: A twenty to twenty-five year follow-up note. *J Bone Joint Surg Am* 1998, 80:704-714.
20. Brenkel IJ, Elson DW: Prediction of poor pain outcomes in total knee arthroplasty. *J Bone Joint Surg Br* 2005, 88-B(SI):28.
21. MacWilliam CH, Yood MU, Verner JJ, McCarthy BD, Ward RE: Patient-related risk factors that predict poor outcome after total hip replacement. *Health Serv Res* 1996, 31(5):623-638. doi:10.1186/1749-799X-7-13 Cite this article as: Smith et al.: Predictors of excellent early outcome after total hip arthroplasty. *Journal of Orthopaedic Surgery and Research* 2012 7:13