Original Article

Clinical assessment after total hip arthroplasty using the Japanese Orthopaedic Association Hip-Disease Evaluation Questionnaire

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ABSTRACT

Aims: The aim of this study was to evaluate clinical outcomes using the Japanese Orthopaedic Association Hip-Disease Evaluation Questionnaire (JHEQ).
Methods: 100 consecutive patients at 6 months after total hip arthroplasty (THA) were evaluated.
Results: The improvement rate for the pain subscale was significantly higher than that for the movement and mental subscales. Preoperative scores on the JHEQ movement and mental subscales were positively correlated to scores on the same subscales at 6 months after surgery.
Conclusion: We conclude that the most predictable aspect of THA is pain relief and preoperative hip-joint ROM and mental status influence 6-month postoperative outcomes.

1. Introduction

Total hip arthroplasty (THA) has revolutionized the treatment of osteoarthritis (OA) of the hip.[1,2] The Harris hip score[3] and Merle d'Aubigné and Postel score[4] are generally used by physicians to evaluate the hip joint. Recently, there has been heightened interest in evaluating patients' quality of life (QOL) after THA. The World Health Organization defines QOL as including physical, material, social, and emotional well-being, as well as individual development and participation in daily activity.[5] To evaluate the outcomes of THA, self-descriptive QOL scores such as the Short Form-36 (SF-36),[6] the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC),[7] and the Oxford hip score (OHS)[8,9] have been used. In Japan, the Japanese Orthopaedic Association hip score has been widely used as a method to assess hip-joint diseases.[10] The problem with evaluations that are based on the perspective of the physician is that the physician's subjective impressions affect the evaluation and may differ markedly from the patient's experience. Also, there may be a large degree of interobserver error.[11,12] The recently developed

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Japanese Orthopaedic Association Hip-Disease Evaluation Questionnaire (JHEQ) includes questions related to common Asian-lifestyle movements, such as using a squatting pan toilet or getting up from the floor. Matsumoto et al[13] suggested that because the JHEQ takes into account such movements, it would improve the assessment of QOL for Asian patients. At the same time, the JHEQ can be useful in Western populations for evaluating patients who frequently engage in deep flexion of the hip joint. The JHEQ also makes possible preoperative and postoperative evaluation of factors that formerly were not assessed. Seki and Hasegawa et al reported that the JHEQ is a reliable and valid tool for evaluating hip disease.[14] Until now, to our knowledge, there have been no reports on clinical evaluation after THA using the JHEQ. We therefore conducted a study using the JHEQ to assess postoperative clinical outcomes at 6 months after THA.

2. Materials and methods

All patients who underwent primary unilateral THA at our institution between May 2011 and May 2012 were eligible for participation in our study. We evaluated a total of 100 consecutive primary patients: 90 women and 10 men. The average age of patients at surgery was 61.6 years (range, 42—82 years). Population characteristics are shown in Table 1.

We evaluated all patients using the JHEQ, including Charnley's functional categories (A, B, and C),[15,16] when we decided to perform THAs for the patients at our outpatient clinic, and then reevaluated them 6 months after surgery. The questionnaires were filled out by the patients themselves while they waited in the outpatient clinic and were then collected by the person in charge or were directly returned by the patients.

All THAs were performed using a posterolateral approach with the patient in the lateral position. Trilogy acetabular cups (Zimmer, Warsaw, IN, USA) with multiple screw holes were inserted and fixed with 2 or 3 screws in all patients. All acetabular components were inserted after being reamed to the same size; 26-, 28-, or 32-mm femoral heads were used, but a much bigger size was selected if the polyethylene was >7 mm thick. Patients received an APS (Zimmer), Kinectiv (Zimmer), S-ROM-A (DePuy, Warsaw, IN, USA), or Modulus (Lima, Udine, Italy) cementless stem or an SC (JMM, Osaka, Japan) or Exeter (Stryker, Kalamazoo, MI, USA) cemented stem. These implants were not randomly inserted but were chosen according to the condition of the femoral bone stock. The wound was drained in each case. All patients received intravenous antibiotics and underwent routine postoperative rehabilitation.

The JHEQ consists of pain (28 points), movement (28 points), and mental (28 points) subscales, with higher scores indicating a better outcome.[3] First, dissatisfaction with the patient's current condition and hip-joint pain on each side are marked on a visual analog scale (VAS) of 0 mm (complete satisfaction or no pain at all) to 100 mm (complete dissatisfaction or maximum pain). The VAS for hip-joint pain is converted to 0 to 4 points (4, VAS 0—20 mm; 3, 21—40 mm; 2, 41—60 mm; 1, 61—80 mm; 0, 81—100 mm). Next, questions for each of the pain, movement, and mental subscales are completed, with possible scores for each item ranging from 0 to 4 (0, strongly agree; 1, agree; 2, uncertain; 3, disagree; 4, strongly disagree). The maximum total score for all subscales combined is 84 points. For questions that are answered separately for the left versus right hip joint, the following criteria were used to determine the laterality to be used for analysis:

- Criterion 1: Use the side that has problems caused by the hip-joint condition.
- Criterion 2: If both sides have problems caused by the hip-joint condition, use the score on the side that has greater pain.
- Criterion 3: If laterality cannot be decided with either criterion 1 or 2, use the side that has lower scores for each item.

We assessed the following parameters

- Clinical outcomes before surgery, using the JHEQ
- Clinical outcomes 6 months after surgery, using the JHEQ
- The correlation between the improvement rate
  - On each subscale (pain, movement, and mental)
  - On the 100-mm VAS
  - On each parameter (the pain, movement, and mental subscales)

Statistical analyses were performed for the differences between subscales using the unpaired Student's t-test, and p values of <0.05 were considered significant. A simple linear regression analysis was used for detecting correlations between improvements in scores on the 100-mm VAS at 6 months after THA and on each parameter (the pain, movement, and mental subscales) at 6 months after THA, and between preoperative and postoperative scores on each subscale. Also, multiple linear regression analysis was carried

Table 1 — Demographic characteristics.	
Characteristic	No. of patients
No. of hips	100
Sex (male:female)	10:90
Mean height (cm)	154.3 (range, 133—185)
Mean weight (kg)	56.2 (range, 30—94)
Body mass index (kg/m^2)	23.5 (SD, ±3.42)
Charnley category	
A	62
B	37
C	1
Etiology	
DDH	92
ONF	8
Stem fixation	
Cemented	25
Cementless	75
Femoral head size	
26 mm	9
28 mm	79
32 mm	12

DDH: developmental dysplasia of the hip; ONF: osteonecrosis of the femoral head.