Perceived Leg Length Discrepancy after Total Hip Arthroplasty

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INTRODUCTION:

Total hip arthroplasty (THA) is an effective treatment for reducing pain and improving functional disability. Leg length equality after THA is important to optimize hip biomechanics and leg length discrepancy (LLD) after THA is a factor of patient dissatisfaction. We sometimes experienced patients who had the difference between perceived LLD and radiographic LLD. The aim of this study was to assess perceived LLD and radiographic LLD before and after THA and to analyze the factors affecting the difference between these LLDs.

METHODS:

We investigated 27 consecutive patients (9 male and 18 female) who underwent unilateral primary THA due to hip disease between June 2010 and March 2011. The patients who could not walk before THA were excluded from this study. The average age at the time of the operation was 59 years (range, 42-84). Of the 27 patients, 19 were diagnosed as osteoarthritis, seven as osteonecrosis of the femoral head and one as rheumatoid arthritis. For all cases, we used the computer navigation to equalize leg length.

We interviewed the patients before operation and three months after operation to obtain their perception of the leg length. We measured the patient’s perceived LLD and radiographic LLD. In order to measure perceived LLD, we placed blocks beneath the leg perceived to be shorter. We defined perceived LLD as the thickness of the block at the point which the patient didn’t perceive LLD. It was recorded in 2.5 mm unit intervals. Radiographic LLD was assessed by measuring vertical distance from inter-teardrop line (a line that connects bilateral inferior margin of the acetabular teardrop) to the most prominent point of the lesser trochanter bilaterally on AP radiographs of the pelvis. A positive value indicates that an affected side is longer than the contralateral side. We also measured Cobb angle on AP radiographs of the lumbar spine and pelvic tilting on AP radiographs of the pelvis. We used Chi-squared tests in the statistical analysis. The level of significance applied was p<0.05.

RESULTS:

Before surgery, the average radiographic LLD was -12.6 mm (range, -46-0) and perceived LLD was -6.5 mm (range, -30-0). On radiographs, 25 (93%) patients were short on the affected side and this was perceived by 13 (52%) patients. Eleven patients (41%) had the difference between perceived LLD and radiographic LLD more than 5 mm. These patients had scoliosis more than 10° of Cobb angle or pelvic tilting more than 5° than patients with the difference between perceived and radiographic LLDs less than 5 mm. (p<0.05).

After surgery, the average radiographic LLD was -1.6 mm (range, -10-6) and radiographic LLDs in all cases were less than ±10 mm. Six (22%) patients perceived LLD after THA and the mean amount of perceived LLD in the cases was 5 mm. Three patients felt an affected side was longer and three patients felt shorter. Radiographic leg shortening was more than 10 mm in four patients who perceived LLD. All the patients who perceived LLD were under 60 years of age and this was significant (p<0.05).

DISCUSSION:

Wylde et al. found that patients with perceived LLD experienced a significantly poorer functional outcome and reported more limping than those patients without perceived LLD. The factors related to perceived LLD include radiographic LLD, the contracture of the hip joint, the inclination of the pelvis due to the scoliosis of the lumbar spine, and the flexion contracture of the knee joint. Perceived LLD is often smaller than radiographic LLD because of the patient’s adjustment.

O’Brien et al. reported that the patients who had a radiographic LLD less than 6 mm after THA did not complain of unequal leg length. In our study, the four patients who perceived LLD had a radiographic LLD less than 6 mm.

The limitation of our study is small number of subjects. We need to study further more patients to analyze the perceived LLD.

SIGNIFICANCE:

Patient’s perceived leg length discrepancy can be different from radiographic leg length discrepancy. We need to assess perceived LLD accurately.

REFERENCES:

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