Little Clinical Advantage of Muscle Sparing over Partial Resection of Gluteus Muscles in Minimally Invasive Anterolateral Total Hip Arthroplasty

Introduction
Minimally invasive total hip arthroplasty (THA) has become common, and several approaches are now used clinically. We have been using an anterolateral (AL) approach with partial resection of the gluteus medius in minimally invasive THA. Recently, faster recovery has been reported using the AL approach with muscle sparing technique (modified Watson-Jones approach) [1]. Our concern is with the difference between muscle sparing and partial resection of the gluteus medius in minimally invasive THA. However, there have been no reports that describe the difference in clinical outcome between muscle sparing and partial resection. The purpose of this randomized study was to compare clinical outcomes using muscle sparing technique and partial resection of the gluteus medius in minimally invasive AL-THA.

Materials and Methods
This study series included 102 patients (83 female, 19 male) with unilateral osteoarthritis of the hip who underwent minimally invasive AL-THA. The mean age at surgery was 64 years (range: 38-83 years). The patients were randomly assigned to the muscle sparing group (n=52) or the partial resection group (n=50). There was no difference in age, gender or BMI between the two groups.

Minimally invasive AL-THA with a 7-cm incision was performed for both groups. In the muscle sparing group, a modified Watson-Jones approach through the intermuscular interval between the gluteus medius and the tensor fascia lata was used. In the partial resection group, the anterior 25 to 35% of the gluteus medius and minimus were divided, and the divided abductors were repaired after implantation.

Harris Hip score (HHS), pain visual analogue scale (VAS), the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), and muscle strength of the iliopsoas, quadriceps, and gluteus medius were examined before surgery, and at 6 weeks, 3, 6, and 12 months after surgery. The muscle strengths of both legs were measured using microFET (Hoggan Health Industries Inc., West Jordan, UT), and the ratio of muscle strength on the affected side to the unaffected side at each follow-up was calculated. In laboratory data, white blood cell count (WBC), C-reactive protein (CRP), and creatine-kinase (CK) were examined before surgery, and at 1, 3, 7, and 14 days postoperatively. We compared those data in the muscle sparing group and the partial resection group. The difference was considered to be significant when the p-value was less than 0.05.

This prospective randomized study was approved by our Institutional Review Board, and written informed consent was obtained from all patients.

Results
HHS, VAS, and WOMAC improved after THA, and there was no difference in these values between the muscle sparing and partial resection groups throughout the study period (Figure 1). The muscle strength of the iliopsoas, quadriceps, and gluteus medius recovered after THA in both groups. Muscle strength recovery in the gluteus medius was better at 6 weeks after surgery in the muscle sparing group (p<0.01); however, there was no difference between the two groups at 3, 6, and 12 months after surgery (Figure 2). In laboratory data, there was no difference in WBC and CRP between the muscle sparing and partial resection groups throughout the study period, whereas creatinin-kinase (CK) at 1 day after surgery was lower in the muscle sparing group than in the partial resection group (p<0.01).

Discussion
In the literature describing the efficacy of the muscle sparing technique in minimally invasive AL-THA, minimizing muscle damage through the intermuscular interval was considered to be important for faster recovery. In practice, however, this technique is difficult in the case of patients with severe subluxation of the hip, muscular male patients, and small patients with little space in the intermuscular interval. For such patients, an approach involving partial resection of the gluteus medius is safer and to be preferred.

In our current study, results of muscle strength recovery and laboratory data after surgery suggested a faster recovery of the gluteus medius and less muscle invasion in the muscle sparing group. However, no difference was seen in HHS, VAS, or WOMAC between the two groups throughout the study period, indicating little clinical advantage in the muscle sparing technique during minimally invasive AL-THA. From these results, we consider that the partial resection of the anterior 25-35% of the gluteus medius and minimus has little effect on the clinical outcome after minimally invasive AL-THA.

Conclusion
Little clinical advantage was observed in using the muscle sparing technique over partial resection of the gluteus medius in minimally invasive anterolateral THA.

References