Incidence of Lumbar Spondylolisthesis in Patients with Severe Knee or Hip Arthritis

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Introduction

The incidence of degenerative osteoarthritis of the hip or knee joint and degenerative changes in the lumbar spine both increase with age. It was reported that lumbar lordosis and sacral inclination were related to the degree of extension of the hip, there may be an associated loss of lumbar lordosis. Many patients also have degenerative changes of the knee with loss of extension which may affect posture and lumbar lordosis. However, the incidence of the combination of lumbar spondylolisthesis and knee or hip joint arthritis is unknown. Thus, we investigated the incidence of lumbar spondylolisthesis in patients with severe knee or hip arthritis.

Patients and methods

We studied 189 patients (165 women and 24 men) with knee osteoarthritis (OA) and 193 patients (174 women and 19 men) with hip OA. The mean age of those with knee OA and hip OA was 73 and 65 years old respectively. They underwent radiological examination of the lumbar spine and the knee or hip in a supine position before surgery, and underwent total knee or hip arthroplasty. Those under 50 years old and with rheumatoid arthritis (RA), trauma, and infection were excluded in this study.

Kellgren-Lawrence (K-L) evaluation system was used for grading both knee and hip OA.

Spondylolisthesis greater than 3 mm in the lateral x-ray view was considered as positive.

Results

The number of knee OA with K-L grade 3 and 4 was, 85 (45%) and 104 cases (55%) respectively. That of hip OA with K-L grade 3 and 4, was 51 (26%) and 142 cases (74%) respectively. Fifty-seven percent of the patients with knee OA were associated with spondylolisthesis. On the other hand, the incidence of spondylolisthesis was 20% in the patients with hip OA.

There was a statistical significance of the incidence of spondylolisthesis between knee and hip OA.

The relationship between the incidence of spondylolisthesis and age was shown in Table 2. Patients ranging from 50 to 59 years old with knee or hip OA associated with spondylolisthesis, 44% and 8%, but those over 70 associated with spondylolisthesis, 61% and 32% respectively. There was a tendency that the older the patients, the more the incidence of spondylolisthesis both with knee and hip OA.

The relationship between OA grade and the incidence of spondylolisthesis was found in 53% and 61% of knee-OA patients with K-L grade 3 and 4 respectively, and it was found in 18% and 21% of hip-OA patients, respectively. There was no correlation between K-L grade and the incidence of spondylolisthesis in both knee and hip OA.

Discussion

The purpose of this study was to assess the incidence of spondylolisthesis of lumbar spine in patients with severe osteoarthritis of the knee or the hip. The influence of the pathological state of the hip joint on the sagittal alignment of the spine was first recognized as hip-spine syndrome by Offerski and MacNab. They found that lumbar lordosis and sacral inclination were related to the degree of extension of the hip. If a patient develops a fixed flexion deformity, of the hip, there may be an associated loss of lumbar lordosis. Many patients also have degenerative changes of the knee with loss of extension which may affect posture and lumbar lordosis. Murata et al reported that lumbar lordosis was significantly reduced in patients whose limitation of extension of the knee. Thus, symptoms from the lumbar spine may be caused by degenerative changes in the knee, and this may be called the ‘knee-spine syndrome’.

It was reported that the prevalence for lumbar spondylolisthesis over 50 years of age was 8 to 12% in Japan. In contrast, the present study showed that 57% of the patients with severe knee OA associated with spondylolisthesis of the lumbar spine. There was a significant difference. Thus, it is speculated that some relationship may exist between the knee OA and lumbar spondylolisthesis.

The weakness of this study is that x-rays of hip or knee and lumbar spine were taken in supine position, not standing position.

However, to our knowledge, this is the first time to analyze the relationship between knee or hip OA and lumbar spondylolisthesis.