



Groin pain associated with sacroiliac joint dysfunction and lumbar disorders



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ABSTRACT

Objective: We investigated the prevalence of groin pain in patients with sacroiliac joint (SIJ) dysfunction, lumbar spinal canal stenosis (LSS), and lumbar disc herniation (LDH) who did not have hip disorders, and evaluated the clinical features that distinguished SIJ dysfunction from LSS and LDH.

Patient and methods: We evaluated 127 patients (57 men, 70 women, average age 55 years) with SIJ dysfunction, 146 (98 men, 48 women, average age 71 years) with LSS, and 124 (83 men, 41 women, average age 50 years) with LDH. The following data were retrospectively collected from the patients' medical charts: (1) the prevalence of groin pain for each pathology; (2) corresponding spinal level of LSS and LDH in the patients with groin pain; (3) the pain areas in the buttocks and back; pain increase while in positions such as sitting, lying supine, and side-lying; an SIJ shear test; and four tender points composed of the posterior superior iliac spine (PSIS), long posterior sacroiliac ligament (LPPL), sacrotuberous ligament (STL), and iliac muscle.

Results: Fifty-nine (46.5%) patients with SIJ dysfunction, 10 (6.8%) with LSS, and 10 (8.1%) with LDH reported groin pain. Of the 10 patients with LSS, five presented with cauda equina symptoms, two had stenosis of L2-L3, and three had stenosis below L3-L4. The other five presented with radiculopathy: the corresponding nerve root was L2, L3, and L4 in one patient each, and L5 in two. Of the 10 patients with LDH, eight presented with radiculopathy: the corresponding nerve root was L2 and L4 in three patients each, and L5 in two. Two patients presented with L4-L5 discogenic pain without radiculopathy. In patients with groin pain, pain provoked by the SIJ shear test and the tenderness of the PSIS and LPPL were significant physical signs that differentiated SIJ dysfunction from LSS and LDH. (Fisher's exact test, $P < 0.05$)

Conclusion: The prevalence of groin pain in patients with SIJ dysfunction was higher than in those with LSS or LDH. When patients who do not have hip disorders complain of groin and lumbogluteal pain, not only lumbar disorders but also SIJ dysfunction should be considered.

1. Introduction

Groin pain is mainly caused by hip disorders, and it can be diagnosed correctly via both clinical symptoms and imaging examinations such as plain radiographs or magnetic resonance imaging (MRI). However, there are patients with groin pain with no specific image findings around the hip joint. This pain may be due to sacroiliac joint (SIJ) dysfunction or lumbar disorders.

Groin pain is reported to affect 9.3% to 44.0% of patients with SIJ dysfunction [1–4], and it has thus been considered one of the characteristic symptoms of SIJ dysfunction in patients. Groin pain can be induced by L1 or L2 radiculopathy according to the dermatome [5] that results from upper lumbar disc herniation (LDH). Interestingly, 4.1% of patients with lower (L4-L5 or L5-S1) LDH also complained of groin pain [6]. Although groin pain is an important symptom of both SIJ dysfunction and lumbar disorders, the exact prevalence, pathomechanism,

and significant physical signs that differentiate those disorders are still uncertain. Therefore, in the present study, we aimed to investigate the prevalence of groin pain in patients with SIJ dysfunction, lumbar spinal canal stenosis (LSS), and LDH, and the clinical features that distinguish SIJ dysfunction from LSS and LDH. We also discussed the pathomechanism of groin pain that originated from both SIJ dysfunction and lumbar disorders.

2. Patient and methods

2.1. Inclusion and exclusion criteria

Between April 2011 and March 2014, inpatients who were diagnosed with SIJ dysfunction, LSS, or LDH at JCHO Sendai Hospital were enrolled in this study. This study was approved by the institutional review board of JCHO Sendai Hospital. All patients provided written

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informed consent for the use of their data in the study.

The pain areas and physical examination results were recorded in all patients' medical charts. Plain radiographs of the lumbar spine and pelvis, and MRI of the lumbar spine were taken to evaluate the pathology of the pain. Patients with two or more suspected origins of pain were excluded from this study. Patients who had complications such as osteoarthritis and surgeries of the hip joint that were confirmed on plain radiographs and through the patient's medical record were also excluded.

2.2. Diagnostic criteria of SIJ dysfunction, LSS, and LDH

After confirming the pain area, result of a pain provocation test, and tenderness points, we diagnosed patients with SIJ dysfunction definitively if their pain improved by $\geq 70\%$ after an SIJ injection under fluoroscopic guidance, similar to the protocol that was used in our previous studies [4,7,8]. Patients with LSS and LDH were comprehensively diagnosed based on physical and MRI findings, and pain relief was achieved using selective nerve root block (SRB), disc block, and/or lumbar spine surgery.

2.3. Patients

One hundred twenty-seven patients, including 57 men and 70 women with an average age of 55 years (range: 18–84 years), were diagnosed with SIJ dysfunction. One hundred forty-six patients were diagnosed with LSS, including 98 men and 48 women with an average age of 71 years (range: 52–87 years). One hundred forty-three patients showed pain relief after lumbar spine surgery, and the pain was improved with an SRB in three patients. As for the corresponding spinal levels, 99 patients had LSS below L3-L4, 36 had LSS at multiple levels, including L2-L3 as the most cranial spinal level. The most cranially involved level was L1-2, and another 11 patients had multiple levels of LSS, which often included L2-L3, L3-L4, and L4-L5 stenosis. One hundred twenty-four patients were diagnosed with LDH, including 83 men and 41 women with an average age of 50 years (range: 16–87 years). In this group, 112 patients experienced improvement their symptoms after herniotomy, nine showed pain relief with the use of an SRB, and three experienced relief after disc block. Five patients had L1-L2 herniation, seven had L2-L3, 16 had L3-L4, 53 had L4-L5, 40 had L5-S1, and three had discogenic pain without radiculopathy from L4-L5 central protrusion-type herniation.

2.4. Clinical evaluations

The prevalence of groin pain was first calculated for each pathology. The corresponding spinal levels of LSS and LDH in the patients with groin pain were confirmed using MRI and SRB. Patients with groin pain were prospectively evaluated about the following items, which were described in their medical records.

1. The pain areas in the buttocks and back, similar to our previous study [4]. The buttock area was divided into four sections, as follows: (1) around the posterosuperior iliac spine (PSIS); (2) middle buttock area: between the horizontal line of the PSIS bottom and the line connecting the bottom of the PSIS with the tip of the greater trochanter of the hip; (3) upper buttock: above the middle buttock area, including the iliac crest but excluding the PSIS; and (4) lower buttock: below the middle buttock area. When the patient had symptoms on both sides, we evaluated the side with the worst symptoms.
2. Positions in which the pain increased, such as sitting on a chair without a backrest [9], supine, and lying on the side [10].
3. The SIJ shear test [11,12] and four tenderness points composed of the PSIS, long posterior sacroiliac ligament (LPSL), sacrotuberous ligament (STL), and iliac muscle [13].

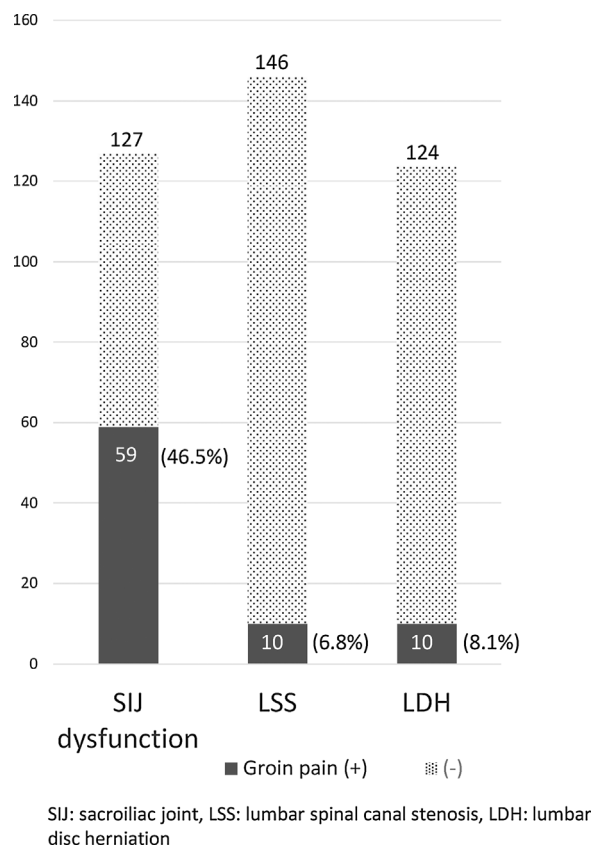


Fig. 1. The prevalence of groin pain.

2.5. Statistical analysis

To clarify the significant physical signs that distinguished SIJ dysfunction from LSS and LDH, statistical analyses were performed using Fisher's exact test. A p -value of < 0.05 was considered significant.

3. Results

3.1. Prevalence of groin pain

Of the 127 patients who were diagnosed with SIJ dysfunction, 59 (46.5%) reported unilateral groin pain. Of the 146 patients with LSS, 10 (6.8%) reported groin pain. Out of these, eight patients had unilateral groin pain and two had bilateral groin pain. Of the 124 patients with LDH, 10 (8.1%) reported unilateral groin pain (Fig. 1).

3.2. The corresponding level of LSS and LDH

Of the 10 patients with LSS who complained of groin pain, five presented with cauda equina symptoms: two had multiple-level stenosis including L2-L3 and three had single-level stenosis below L3-L4. The other five patients presented with radiculopathy: the corresponding nerve root was L2, L3, and L4 in one patient each, and L5 in two (Table 1).

Of the 10 patients with LDH who complained of groin pain, eight presented with radiculopathy. Of these eight, the corresponding nerve root was L2 and L4 in three patients each and L5 in two. Two patients presented with discogenic pain without radiculopathy, and they had protruded disc herniation at the L4-L5 level (Table 2).

3.3. Pain areas in the buttocks and back

The pain areas in the buttocks and back of the patients who

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