A Comparison of Two Different Methods to Treat Hip Pain in Runners

Michael T. Cibulka, MHS/PT, OCS
Anthony Delitto, PhD, PT

Hip pain in runners is a common problem treated by orthopaedic and sports physical therapists. Even though runners are frequently seen with hip pain at a young age (15–35 years old), have anterior or inguinal hip pain, and have no evidence of osteoarthritic changes in the hip joint, no studies in the physical therapy literature exist on the treatment of anterior hip pain.

Although the physical therapy literature has little information on the treatment of hip pain, physical therapy textbooks describe a number of different treatment methods for hip pain. One of the most common physical therapy treatments described for hip pain is mobilization, specifically, distraction of the hip. Mobilization is thought to reduce joint pain through the stimulation of afferent nerve receptors or by improving joint lubrication. Mobilization of the hip is also used to help restore joint mobility. To date, however, no one has demonstrated the effectiveness of treating hip pain with distal distraction.

Pelvic obliquity is also considered to be an important component in the development of hip pain or arthritis. Pelvic obliquity is often related to hip irritation and pain. Bjerkreim has shown an association between pelvic obliquity and hip arthritis.

In addition, several authors have also shown a relationship between pelvic obliquity and hip pain. A common cause of pelvic obliquity is sacroiliac joint dysfunction. Pelvic obliquity develops when one anterior superior iliac spine is higher than the other. In sacroiliac joint dysfunction, the innominate bones tilt in an equal but opposite direction, resulting in one anterior superior iliac spine being higher than the other.

A manipulative technique presumed to be directed to the sacroiliac joint has been shown to reduce the signs of sacroiliac joint dysfunction. However, no one has demonstrated the effectiveness of treating hip pain by eliminating sacroiliac joint dysfunction. The purpose of this study was to compare the effect of mobilization of the hip with that of eliminating sacroiliac joint dysfunction on hip pain. The hypothesis tested was that a manipulative treatment directed to the sacroiliac joint would decrease the intensity and duration of hip pain and improve passive hip internal rotation more than just mobilizing the hip with long axis distraction.

METHOD

Subjects

Criteria for inclusion in the study included a complaint of primary anterior (inguinal region) or lateral (greater trochanter region) hip pain or both. Subjects were excluded if they had primary iliac crest pain or pain posterior to the greater
in this study, subjects must have had: pain localized to the anterior or lateral aspect of the proximal femur, no pain on resisted muscle contraction to any of the hip muscles, no pain on stretching any of the hip muscles, and anterior hip or groin pain on performance of Faber's test (Patrick's test).

Subjects with a medical diagnosis of hip pain or strain were referred by a physician within 3 weeks of onset of hip pain. None of the subjects tested had an antalgic gait, a positive Trendelenburg test, or evidence of arthritic changes on radiographs (no joint space narrowing, apparent cartilage erosion, or presence of osteophyte(s)). Documentation of radiographic changes were made by contacting the referring physician's office.

All subjects were involved in some sort of athletic activity. Most were runners or joggers and had activity levels greater than 3 on the Saltin scale (27). The Saltin scale is used to determine the relative physical activity level for each subject with scores ranging from 0 for sedentary subjects to 4 for highly active subjects. No one was involved in litigation or workman's compensation claims. Informed consent was obtained before participating in the study, and the study was approved by an internal review board of the Jefferson County Rehabilitation & Sports Clinic.

Subjects had evidence of sacroiliac joint dysfunction. The presence of sacroiliac joint dysfunction was an unforeseen event in all of the subjects. Sacroiliac joint dysfunction was confirmed by the presence of at least three of the following four tests: a positive standing flexion test, uneven posterior superior iliac spines when seated, a positive supine long sitting test, and a positive prone knee flexion test. The reliability of using this combination of tests for detecting sacroiliac joint dysfunction has been reported to be high (5).

Procedure

Twenty subjects met the established criteria and volunteered for this study. The subjects were randomly assigned to one of two groups. One group was treated by manipulation of the sacroiliac joint (N = 10), and another group was treated by mobilizing the hip joint (N = 10). Subject characteristics of the two groups are shown in Table 1. Only subjects who had a complaint of identical or similar hip pain on the involved side with the Faber test as they did while running were included. None of the subjects had hip pain with the Faber test on the uninvolved side. The Faber test was selected because many orthopaedic and physical therapy texts claim that the Faber test can detect hip joint irritation (6,20,22,28,30,32). The Faber test was performed by flexing the subject's hip to 90° and externally rotating and abducting the hip. The lateral malleolus of the involved side rested just above the patella on the uninvolved side. A simultaneous posterior pressure was applied slowly to the medial aspect of both medial malleoli while supine and then on long sitting. A change in relative leg lengths from supine to long sitting suggests sacroiliac joint dysfunction (5,6,32).

Mobilization is thought to reduce joint pain through the stimulation of afferent nerve receptors or by improving joint lubrication.

The prone knee flexion test was performed by comparing the left and right soles of the heel while prone and then again with both knees flexed to 90°. A change in relative leg length from prone to knee flexion suggests sacroiliac joint dysfunction (5,6,32).
Manipulation Group | Mobilization Group
---|---
Age (years) | 16 (1.2) | 24 (9.0)
Gender | 5M, 5F | 5M, 5F
Height (in) | 66 (3.6) | 74 (3.0)
Weight (lbs) | 140 (30.4) | 169 (28.8)
Miles run per week | 28 (15.2) | 18 (10.4)
Saltin Scale (0-4) | 3.7 (67) | 3.7 (67)

TABLE 1. Means followed by standard deviation in parenthesis for age, gender, height, weight, miles run per week, and Saltin Activity Scale for the two treatment groups.

The Faber test was performed initially during the first examination, immediately after treatment, and then on the follow-up visit. The follow-up visit was scheduled for 3 days later, although because of weekends and work schedules, we could not strictly enforce this. The average length of time between the initial and follow-up visit in the manipulation group was 3.6 days. In the hip mobilization group, the average length of time between the initial and follow-up visit was 4.1 days.

The hip mobilization group was treated by mobilizing the hip joint with long axis distraction as described by Kaltenborn (15). Long axis distraction was used because of previous clinical success, and it has been recommended by Kaltenborn, Kessler, and Lee for relief of pain and improvement in mobility (15,16,18). Briefly, the patient lies supine on the table. A strap through the groin stabilizes the body. The involved hip is flexed approximately 30° and is slightly externally rotated (10°-15°). The therapist holds both hands around the malleoli of the involved hip. The therapist then leans backward to create distal distraction of the hip.

Twenty distal distractions were performed on the involved hip. The first 10 were Grade II mobilizations. After a 1-minute rest, the second 10 were Grade IV mobilizations.

The manipulation treated group received a manipulative technique purported to eliminate sacroiliac joint dysfunction. The manipulative technique was chosen because of previous success in eliminating the signs of sacroiliac joint dysfunction. The manipulative technique was performed with the patient supine in side bent position with the concavity away from the therapist. The subjects were instructed to clasp their hands together and put them behind their neck. The therapist then placed one arm through the subject’s clapsed arms, rotated the subject towards him, and placed the other hand on the subject’s anterior superior iliac spine that was furthest away. The manipulation was accomplished by quickly pushing down on the subject’s anterior superior iliac spine while holding the subject’s upper body rotated toward the therapist (5) (Figure 2). The technique was applied on the same side as the painful hip. To determine successful elimination of the sacroiliac joint dysfunction after treatment, the four previously described tests for sacroiliac joint dysfunction (the standing flexion test, palpation of PSIS while sitting, the supine long sitting test, and the prone knee flexion test) were performed again. If sacroiliac joint dysfunction was found after treatment, the sacroiliac joint was treated until the sacroiliac joint dysfunction was eliminated. Nine subjects needed only one manipulation to eliminate sacroiliac joint dysfunction, while one subject needed a second treatment.

Between the first-day evaluation and subsequent follow-up, the subjects were told to resume all activities unless they experienced significant pain.

FIGURE 1. The Faber test.

On the follow-up visit, subjects were again asked to fill out a pain questionnaire. Each patient was asked to circle the number that best described their hip pain with normal walking and activities of daily living. Once the patient finished the pain questionnaire, a physical therapist performed the Faber test. The physical therapist who performed the Faber test was unaware of how the patient was treated. A complaint of similar or exact reproduction of the hip pain that they usually developed with running with the Faber test indicated a positive test. A complaint of dissimilar or no complaint of hip pain indicated a negative test.

**Data Analysis**

To determine the relationship between before and a few days after treatment for the Faber test, a 2 × 2 Chi-Square statistic with Yates correction for continuity was performed (31). The Whitney-Mann U statistic was used to determine if a difference existed between pre and postpain scores (31). Passive hip internal rotation was analyzed with the t-test with a Bonferonni correction. The alpha level was set at $p < .05$.

**RESULTS**

Since all of the subjects in both mobilization and manipulation groups had a positive Faber's test immediately after treatment, and their pain scales were unchanged, we used only the follow-up visit measures for both the Faber test and the pain scores. On the follow-up visit, statistical analysis demonstrated that a significant difference existed between the groups with respect to pain scores (Whitney-Mann $U = 81.50; p < .016$). The manipulation group had a mean improvement (reduction of perceived pain) of 3.8 (out of 10), while the hip mobilization group presented with a mean improvement of only .8 (out of 10). Also, statistical analysis demonstrated a significant difference between the two groups when comparing the initial and the follow-up Faber test a few days later ($x^2 = 5.21; df = 1; p < .02$). In the manipulation group, nine of 10 subjects had a negative (pain-free) Faber test when they were reevaluated a few days after treatment. In the hip mobilization group, only three of 10 subjects had a negative Faber test when they were reevaluated a few days after treatment. No significant differences in passive hip internal rotation were found between the involved and uninvolved hip of either groups before treatment ($t = 1.34; df = 18, p = .195$).

**DISCUSSION**

The manipulation group had less perceived hip pain than the hip mobilization-treated group 3 days after treatment. Also, the manipulation group had less hip irritation, as demonstrated by the absence of pain in nine of 10 subjects with the Faber's test 3 days after treatment. The results of this study suggest that treating sacroiliac joint dysfunction is an effective method to reduce hip pain over a few days in runners.

To date, no one has shown a relationship between hip pain and the sacroiliac joint. Pelvic obliquity, from leg length disparity, has been associated with hip pain and arthrosis (11,12). Sacroiliac joint syndrome creates pelvic obliquity (5). Offierski and MacNab reported that hip and spine disease often develop concurrently (24). Bjerkreim, Friberg, Goftron, and Steindler have reported that pelvic obliquity creates hip incongruence (2,11,12,29), which has been frequently implicated as a predisposing factor in hip arthritis (2,11,12,23).

Distal distraction was selected because many authors describe this technique as an effective method to reduce hip pain (16-18,32). However, the effectiveness of this technique has never been demonstrated.

The reason why treating the sacroiliac joint reduced hip pain is unknown. Perhaps sacroiliac joint dysfunction created changes in the muscular forces about the hip joint. Merchant (21) has demonstrated that the abductor muscle force acting on the hip joint changes with pelvic obliquity. Also, pelvic obliquity may have created changes in hip joint congruence. Goftron's (12) and Morscher's (23) have both shown that pelvic obliquity from a leg length discrepancy produces hip joint incongruence. Although the changes in muscle force and joint congruence from Goftron's (12) and Morcher's (23) studies were the result of pelvic obliquity from leg length disparity, sacroiliac joint dysfunction may possibly create similar changes. We believe further study is necessary to
understand the effect sacroiliac joint dysfunction has on hip joint pain.

The Faber test was positive in all subjects immediately after treatment, regardless of the treatment. This finding suggests that the hip joint needed some time to recover after treatment. The recovery time may be due to a slow change in hip joint pressure or time needed for the inflammatory response to abate. Also hypothetically, the delayed response in the Faber test could be due to slower reacting capsular or articular cartilage changes.

The subjects in this study were all young athletes who had hip pain for only a short time (less than 3 weeks). The clinician is warned against generalizing the results of the present study to older subjects with arthritic hips. However, studying the relationship between sacroiliac joint syndrome and hip joint osteoarthritis in older patients would be interesting.

**CONCLUSIONS**

The results of this study show that manipulating the sacroiliac joint is an effective treatment for hip pain in subjects with sacroiliac joint dysfunction and that passive internal rotation of the hip is not lost in the young patient with acute hip pain. Therefore, clinicians should assess the sacroiliac joint in patients with hip pain.

**REFERENCES**


