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Sacroiliac Dysfunction and Lumbopelvic Instability

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Introduction

The sacroiliac (SI) joints as a source of low-back trouble need very little justification to chiropractors. Pain from the SI joints has been proven to cause not only low-back pain, but also groin and thigh pain.[1] This pain distribution and palpable tenderness caudal to the PSPS (Fortin's test) are fairly reliable indicators that the pain generator is the SI joint.[2] Surprisingly, orthopedic tests such as Yeoman's or Gaenslen's tests are not very reliable. Motion palpation tests such as Gilette's tests are also unreliable if used alone. This paper will discuss new information regarding how to identify and treat lumbopelvic instability.

Clinical Biomechanics of the SI Joints

The self-locking mechanism of the pelvis is called form or force closure.[3] Form closure is due to the anatomy of the SI joints, mainly their flat surfaces, and promotes stability. Unfortunately, these flat surfaces are vulnerable to shear forces such as can occur during walking. Recent work by Pool-Goudzwaard et al. has demonstrated how muscles, ligaments and the thoracolumbar fascia aid in stabilizing the pelvis, thus achieving force closure.[3] This is necessary during walking when unilateral loading of the legs introduces shear forces, and the muscle-ligament-fascia system is required to stabilize the pelvis by compressing the SI joints.

The sacrotuberous and long, dorsal sacroiliac ligaments are responsible for limiting nutation and counter-nutation, respectively. Insufficient ligamentous tension will decrease force closure. Three muscle slings -- a longitudinal, a posterior oblique and an anterior oblique sling -- are the active components in the pelvic stabilization system. The muscular slings are described in the following table.

Table I: Muscle Slings Responsible for Force Closure of the SI Joints

Longitudinal Sling

- multifidus attaching to the sacrum
- deep layer of the thoracolumbar fascia
- long head of biceps attaching to the sacrotuberous ligament

Posterior Oblique Sling

- latissimus dorsi and contralateral gluteus maximus

Anterior Oblique Sling

- external and internal oblique abdominals
- transverse abdominus

Other Muscles

- respiratory diaphragm
- pelvic floor

Assessment

Pain provocation, mobility and stability of the pelvis should all be tested. Individual motion palpation tests are not reliable, but when a battery of four SI tests are used together, if three of the four are positive, a reliable classification of the patient as having SI dysfunction can be made.[4] A new stability test called the active straight-leg-raising test (ASLR) has been described by Mens et al.[5] This test can be used to verify which SI joint is unstable and as a posttreatment check to determine if a trial treatment is of value (see table II).

Table II: The Active Straight Leg Raising Test

- Patient lies supine
- Actively lifts one leg 5 cm up

Test is positive if:

- The leg can’t be raised up, or
- If there is decreased strength (doctor should add resistance)

Recheck:

- With SI belt
- After treatment (e.g., SI mobilization, postisometric relaxation of piriformis, adductors, etc.)

Treatment

Treatment encompasses advice, manipulation and exercise. Offer advice about lumbopelvic posture during sitting, standing, walking, lifting and carrying activities. In particular, give advice to avoid creep during prolonged sitting. Also, a SI stabilization belt may be indicated until neuromuscular control of posture is reeducated subcortically.

Manipulation or mobilization of the blocked SI joint is needed. Other manual or semiactive therapy to consider includes myofascial release of the lumbodorsal fascia and postisometric relaxation of the adductors, piriformis, hamstrings, quadratus lumborum, iliopsoas, latissimus doris, erector spinae or tensor fascia lata.

Exercise should focus on reactivating the deep intrinsic stabilizers such as the transverse abdominus, internal oblique abdominals and multifidus muscles. The quadratus lumborum, gluteus medius, gluteus maximus and latissimus dorsi may also require endurance training.

Summary

The SI joints are an important source of pain and activity intolerances. Force closure of the SI joints requires appropriate muscular, ligamentous and fascial interaction. The ASLR test can help determine if a specific treatment is effective. Advice about posture and support, manipulation of the SI joints along with manual therapy of related muscles and fascia, and exercise of key stabilizers are all important components in reestablishing lumbopelvic stability.

References

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