Osteopathic Diagnosis of an Acetabular Injury

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Physical findings demarking pathologic somatovisceral reflex activity and fascial strain patterns may lead the osteopathic physician to diagnoses that are masked within the initial presentation of a patient. The authors present a case report that demonstrates the use of osteopathic principles in the diagnosis of a chronic acetabular fracture and acetabular labral tear in a 19-year-old man. The injuries resulted from a posterior hip dislocation sustained during a basketball game more than 1 year before presentation. Osteopathic manipulative treatment and diagnostic techniques also relieved the patient’s persistent thoracic pain, nausea, and vomiting. Subsequent orthopedic repair had the potential to avert or delay degenerative hip disease in the patient.

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He [the osteopath] should never dally with effects but ever go back to the cause which when corrected results in a disappearance of the effect.

—and Andrew Taylor Still, MD, DO

The most common mechanism for unilateral posterior hip dislocation is a “dashboard” motor vehicle collision (ie, an impact resulting in a force being driven up the shaft of the femur and in a shifting of the hip posterior to the pelvis). Some cases of sports-related posterior hip dislocations, including those occurring in American football, rugby, and soccer, have been reported in the literature. On review of the literature covering posterior hip dislocations, we also noted a few reports of hip dislocations sustained during basketball. These previously reported basketball-related hip dislocations were diagnosed in close temporal proximity to the initial injury, and they were not self-reduced.

The present case report, to our knowledge, is the first documented acetabular injury resulting from a self-reduced, basketball-related hip dislocation diagnosed several months after the initial injury with the aid of osteopathic appreciation for pathologic somatovisceral reflexes and fascial strain patterns. Therefore, we believe that the present case adds to the body of literature demonstrating the vital role of osteopathic manipulative treatment (OMT) and diagnostic techniques for patients with musculoskeletal pain complaints.

Report of Case

The patient in the present case is a man, aged 19 years, who presented to an osteopathic family practice clinic in autumn 2007 for evaluation of nausea, vomiting, and mid-thoracic back pain. In the summer of 2007, he graduated from high school, where he had been a competitive basketball player. The patient noted that his pain began more than 1 year before presentation, during his final season on the high-school basketball team. The pain arose after a competitor landed with his knee in the left lateral region of the patient’s thoracic spine.

The patient had been evaluated by three diagnosticians before he visited the osteopathic family practice clinic. A series of tests had been ordered for the patient, and results of those tests were available for review. Approximately 3 months before presentation, results of abdominal computed tomography (CT) scans—with and without contrast—as well as colonoscopy and esophagogastroduodenoscopy (EGD) were normal. Thoracic spine CT revealed a “mild disk compression” at the T7-8 disk. The physician who had ordered these tests also prescribed opiates to abort the patient’s pain syndrome. He was still taking these opiates at the time of presentation.

At presentation, results of head, ears, eyes, nose, throat (HEENT); abdominal; cardiac; lung; and neurologic physical examinations were within normal limits. Pulpation of the thoracic paraspinal musculature precipitated nausea and flushing. On osteopathic structural examination, the patient’s occiput was rotated left and sidebent right. The C2 vertebra was rotated and sidebent left. The C3 through C7 vertebrae were rotated and sidebent right. The T4 through T9 vertebrae were rotated left and sidebent right. The accompanying ribs were inhaled on the left side.
Myofascial trigger points and counterstrain tender points were noted throughout the patient’s thoracic paraspinal musculature. The celiac ganglion plexus was hyperactive, and, when palpated, caused thoracic pain and nausea.

In addition, the L5 vertebra was flexed, rotated right, and sidebent right. Left-on-left sacral torsion was present. The left innominate bone was sheared superiorly, with accompanying spasm of the left iliohypogastric and piriformis.

Musculoskeletal examination at presentation also revealed multiple vectors of fascial strain patterns, the summation of which pulled inferiorly toward the left pelvis. The discovery of these fascial strain patterns led to further questioning of the patient about injuries to the pelvis. Upon questioning, the patient reported that 2 weeks before his thoracic injury occurred, he sustained a traumatic acetabular dislocation in his left posterior femur. This acetabular dislocation occurred during a basketball game as the patient came down from a jump shot and landed with the femur flexed and adducted on the left side, causing a posterior vector of force through the acetabular joint.

According to the patient, he did not compete in the remainder of the game, allowing his acetabular dislocation to self-reduce. The patient said he began to play again during the week after his injury, and he completed the season. He experienced no hip pain during the rest of the season, though his thoracic pain continued.

In light of the report of this additional history—coupled with the physical examination findings at presentation—dysfunction at the left hip was believed to be the “key” dysfunction predisposing the patient to the severity and chronicity of his other dysfunctions.

During the 3 weeks after presentation, an osteopathic physician (N.C.C.) provided the patient with extensive OMT in his cervical, thoracic, lumbar, and pelvic regions. Four 30-minute OMT sessions were performed during the 3-week period. The OMT techniques used comprised balanced ligamentous tension, celiac ganglion inhibition, counterstrain, high-velocity, low-amplitude technique, muscle energy, and myofascial release. The patient’s thoracic pain and nausea declined in severity throughout the 3-week treatment period. In addition, the patient was taught to self-inhibit the reflex activity of the celiac ganglion, which contributed to reducing his nausea and vomiting.

Notably, as the patient’s thoracic and visceral symptoms subsided, left hip pain emerged and steadily increased—despite the fact that the musculature was becoming increasingly supple in the hip region. As the fascial strain patterns in the thoracic spine resolved, a new vector of strain manifested in a caudal direction pulling into the left hip. By the time of the patient’s last OMT session, he could tolerate only minimal counterstrain and indirect myofascial release to the left hip region.

Also at the time of the final OMT session, the patient described the onset of left hip subluxation, which he characterized as a sensation of “a popping out” that became worse with stair descent. Results of Patrick-Fabere, fulcrum, and modified posterior compression tests demonstrated laxity of the hip joint capsule, which had not been found in previous examinations. The laxity had apparently been masked by a reduction of protective hypertonicity of the hip musculature caused by the counterstrain and myofascial release techniques.

A hip joint capsular tear and/or acetabular labral tear was suspected of being responsible for the left hip subluxation. Magnetic resonance imaging revealed an abnormality involving the posterior portion of the acetabulum (Figure 1). Computed tomography arthrography of the left hip confirmed the suspicion of a posterior capsular tear, a probable labral tear, and a posterior acetabular fracture deformity—seen in middle axial view in Figure 2 and in superior axial view in Figure 3.

After these test results were obtained, the patient was referred to an orthopedic surgeon for repair of the injuries. The surgeon reported that the degree of damage to the patient’s labrum and acetabulum was more extensive than originally expected based on the CT and magnetic resonance images alone. Nevertheless, both the labral tear and the acetabular fracture were repaired by open reduction and internal fixation.

After surgery, the patient participated in physical therapy, which led to gradual improvement that plateaued with residual pain. Six months after surgery, follow-up consult with the surgeon indicated that some of the bone fixation hardware in

Figure 1. Magnetic resonance image of the left hip, suggesting an abnormality involving the posterior portion of the acetabulum (arrow) in a 19-year-old man who sustained posterior hip dislocation during a basketball game more than 1 year before presentation.
the patient was leading to the pain syndrome. The surgeon and patient elected to have some of the internal fixators removed.

At the time of the present report, 2 months after fixator removal, pain severity had decreased in the patient, he had been weaned off of narcotics, and he was heavily engaged in physical therapy.

Comment

Posterior hip dislocations generally occur as a result of high-energy trauma, such as that encountered in motor vehicle collisions or that experienced in such full-contact sports as football and rugby. Posterior dislocations constitute 90% to 95% of hip dislocations, and hip dislocations account for 5% of all traumatic joint dislocations. Hip dislocations are typically classified as Grade I (dislocation with no fracture), Grade II (dislocation with acetabular rim fracture, stable postreduction), Grade III (dislocation with acetabular rim fracture, unstable or comminuted), and Grade IV (dislocation with femoral fracture).

The patient in the present case sustained a Grade II dislocation that self-reduced within 1.5 hours, with comparatively minimal sequelae. Improper management of this condition can lead to early osteoarthritis and eventual total hip replacement, a procedure that costs an average of approximately $45,000. In retrospect, it is clear that the patient’s hip musculature effectively splinted his acetabular injury, leading to delayed diagnosis, and the subsequent trauma produced additional somatic dysfunction and the patient’s presenting complaints.

The mechanism of viscerosomatic pain involves the irritation of a pathologic organ stimulating the afferent neurons that synapse in the dorsal horn with internuncial neurons. The afferent stimulation results in a proportional repeated stimulation. This repeated stimulation leads to autostimulation of the internuncial neurons, which, in turn, leads to the excitation of the local musculature, resulting in myosensitivity. The myospasticity then results in the segmental somatic dysfunction.

If the magnitude of the excitation of the internuncial neurons is large enough, it can result in spontaneous firing of ascending neuronal tracts, resulting in referred pain. Through this mechanism, viscerosomatic pain is evident in many intra-abdominal pathologic conditions, such as pain in the right trapezius region with acute cholecystitis, and pain in the left arm with acute coronary syndromes. In somatovisceral dysfunction, a primary somatic dysfunction causes excitation of the somatosensory nociceptive neurons that act as the afferents.

The present case report supports the osteopathic concept that an appreciation of body unity, self-regulatory mechanisms, and interrelationship of structure and function is a powerful diagnostic and therapeutic tool. Although nausea and vomiting may be associated with pain from any source, the physical findings and patient response to treatment in the present case are more consistent with the interpretation that somatovisceral reflexes were the mechanism responsible for producing the nausea and vomiting.

The hypertonicity of the patient’s hip musculature was manifested as a fascial strain pattern. The diagnosis of an asymptomatic primary hip pathologic condition resulted from recognizing and reducing the fascial strain. This hip condition most likely would have remained hidden until, at a later
time, degenerative sequelae emerged—considering that the condition had eluded three diagnosticians previous to the patient’s presentation at our osteopathic clinic.

Through myofascial release and counterstrain techniques of OMT, the hypertonicity of the patient’s hip musculature was relieved. Then careful application of the Patrick-Fabere, fulcrum, and modified posterior compression tests during a follow-up physical examination demonstrated a pathologic condition in the femoral-acetabular joint, leading to the use of direct imaging to discover the patient’s true injury.

The use of osteopathic concepts and methods in the present case may have averted degenerative arthritis and, consequently, much greater emotional stress and financial costs to the patient.

Conclusion
The use of standard osteopathic manipulative treatment and diagnostic techniques relieved persistent thoracic pain, nausea, and vomiting—and it uncovered a posterior acetabular fracture and labral tear—in a patient who sustained injury in a basketball game more than 1 year before presentation. The subsequent orthopedic repair had potential to avert or delay degenerative hip disease in the patient.

References