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Research Paper Review

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A suggested model for physical examination and conservative treatment of athletic pubalgia

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ABSTRACT

Background

Athletic pubalgia (AP) is a chronic debilitating syndrome that affects many athletes. As a syndrome, AP is difficult to diagnose both with clinical examination and imaging. AP is also a challenge for conservative intervention with randomized controlled trials showing mixed success rates. In other syndromes where clinical diagnosis and conservative treatment have been less than clear, a paradigm has been suggested as a framework for clinical decision making.

Objectives

To propose a new clinical diagnostic and treatment paradigm for the conservative management of AP.

Design

Relevant studies were viewed with regard to diagnosis and intervention and where a gap in evidence existed, clinical expertise was used to fill that gap and duly noted.

Results

A new paradigm is proposed to assist with clinical diagnosis and non-surgical intervention in patients suffering with AP. The level of evidence supporting this paradigm, according to the SORT taxonomy, is primarily level 2B.

Conclusions

Further testing is warranted but following the suggested paradigm should lead to a clearer diagnosis of AP and allow more meaningful research into homogeneous patient populations within the AP diagnostic cluster. Strength-of-Recommendation Taxonomy (SORT): 2B.

ANALYSIS

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Background Information

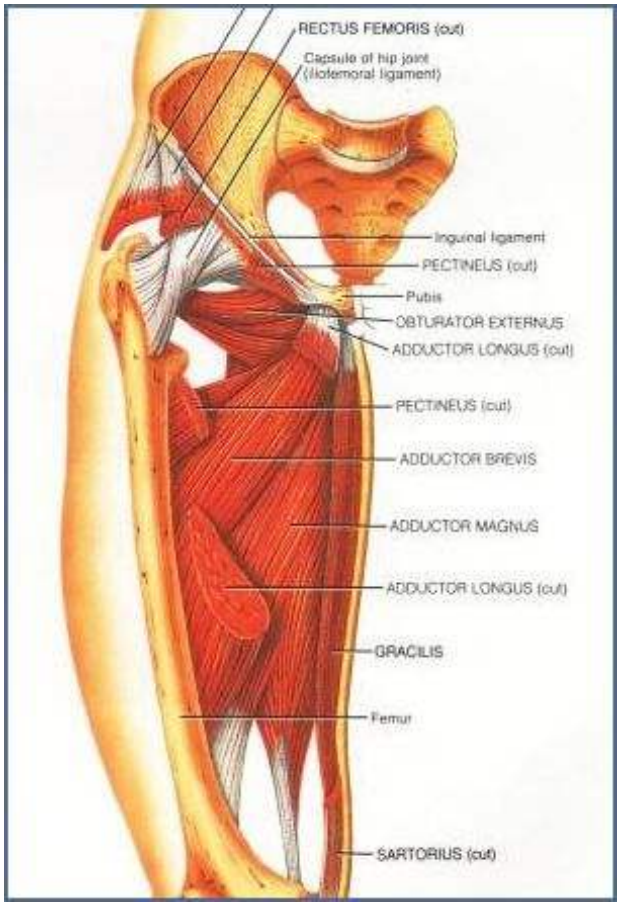
Athletic Pubalgia (AP), or groin/pubic region pain, is a common injury in many dynamic sports such as hockey, football and soccer. The authors of this study comically termed this commonly injured area "the Bermuda triangle of sports medicine". This is the best way to describe how many of us feel when a challenging case of groin pain appears in the clinic! Not only is it difficult to find the 'ouchie' in many cases, but even more challenging to find the root cause of the problem. In cases of AP, the 'ouchie' could be a true hernia, inguinal syndrome, osteitis pubis, adductor or gracilis muscle related problem or another diagnosis…a long list of possibilities.

The goal of this study was to propose a new clinical diagnostic (and treatment) paradigm for AP patients. The authors used relevant studies for diagnosis (and treatment) and where a gap in evidence existed, clinical expertise was used to fill that gap. Due to the broad nature of treatment interventions for AP, the focus of this review is predominantly on the clinical exam and diagnosis.

OPERATIONAL DEFINITION & BRIEF ANATOMY REVIEW

Due to the umbrella term of athletic pubalgia and the wide range of problems associated with the groin, medial thigh, lower abdomen, or pubic region, the authors defined these injuries as: "damage to the tendons, fascia, or sheaths in our defined region exempting inguinal hernia and inflammation of the pubic bone from systemic disease or fracture". Therefore, this may include: tendinopathies, osteitis pubis, posterior inguinal wall insufficiency and nerve entrapments in the inguinal region.

Anatomical potential causes of AP include: the rectus abdominus, internal oblique, external oblique, transverse abdominus muscles/tendons/sheaths, inguinal ligament, adductors, the gracilis, the pectineus, and the iliopsoas. The pubic symphysis is innervated by the genitofemoral and pudendal nerves; the adductor group and gracilis by the obturator nerve; the pectineus and iliacus by the femoral nerve; the psoas directly from the lumbar plexus (L1-3); the rectus abdominus by the thoracoabdominal nerve (originating partially from L1-2); and the internal oblique, external oblique, and transverse abdominus muscles receive innervations from the distal thoracic/upper lumbar spine.



THEORIES OF PAIN & DYSFUNCTION IN ATHLETIC PUBALGIA

The most prevalent theory revolves around nerve entrapment of the cutaneous branches of the ilioinguinal or the genitofemoral (genital branch) nerves secondary to weakness in the posterior wall of the inguinal canal.

The next most common theory is biomechanical and has to do with the imbalance between the anatomic structures that dissipate loads. This region is a key link in transferring forces from the lumbosacral region to the hip joint. In AP cases, the athlete can't transmit the loads that are imposed on the pelvic bone and pubic symphysis during their sport, which can lead to pelvic instability and, in turn, damage to the soft tissues and joints in the region.

CLINICAL EXAMINATION

History

AP patients will typically present with noncontact-related, unilateral pain in the adductor region and/or lower abdominals. They'll have had multiple pain episodes and perhaps report a chronic problem. If the condition worsens, it can become bilateral, or pain can radiate into the testicular region in men. Many of these patients will be high level athletes in soccer, hockey, rugby or football. There were several pain and function questionnaires mentioned in this section of the paper but their utility is beyond the scope of this review.

Observation

Many of these patients will present as male, older and more experienced athletes that play a sport that involves cutting movements. However, there are exceptions: female runners have a high incidence of AP and competitive hockey may have no gender differences. Observed findings like ecchymosis, an obvious inguinal bulge, or antalgic gait are inconsistent or non-existent.

Triage and Screening

During the clinical exam the clinician should rule out more serious pathology that requires imaging and any condition that may be outside their scope of practice (i.e. gynecological, rheumatologic, oncologic etc.). The clinician can refer, treat independently, or treat and refer. One must also keep an eye out for red flags such as a history of trauma, fever, unexplained weight loss, burning with urination, night pain and prolonged corticosteroid use. Once these have been ruled out it is important to examine the structures away from the pubic region that may cause groin pain (lumbosacral area, hip – arthritis, labral tear, impingement, stress fracture etc.). A general exam would not be complete without a neurological screen; dermatome, myotome, reflex and upper motor neuronal function.

SPECIAL TESTS FOR RULING OUT OTHER CONDITIONS

- *Repeated lumbar motion*: The patient repeats forward, backward, and side bending. This test is used to examine the lumbar spine.
- *Thigh Thrust Test*: The patient is supine and the hip and knee are flexed to 90°. The examiner provides compression along the long axis of the femur using a hand under the patient's sacrum as a wedge to create shearing force at the sacro-iliac joint. This test is used for sacro-iliac pathology.
- *Flexion Adduction Internal Rotation Test (FADIR)*: The patient is supine. The examiner moves the patient's leg into the combined motions of flexion, adduction, and internal rotation. This test is used to evaluate for femoral/acetabular Impingement and labral pathology.
- *Hip ROM*: Limitation of any hip motion in 2 or more planes can be a sign of OA.
- *Patellar Pubic Percussion Test*: A stethoscope is placed on the pubic bone while the examiner either taps or places a tuning fork on the patella. If auscultation produces like sounds bilaterally, then femoral neck fracture can be ruled out. Different sounds indicates that imaging may be required
- *Fulcrum Test*: The patient is seated at the end of a table with the examiner's forearm placed under the thigh. The examiner pushes the patient's leg down on to the forearm. If the patient's pain is not reproduced, then a femoral stress fracture can be ruled out. A positive test indicates a need for imaging.

SPECIAL TESTS FOR ATHLETIC PUBALGIA

Once the clinician has ruled out the lumbosacral spine, intra-articular hip pathology, fractures, and other sources of referred symptoms to the groin region they can move onto the next set of tests. The clinician starts with active and passive range of motion testing, palpation, strength testing, and finally, specific special tests for AP.

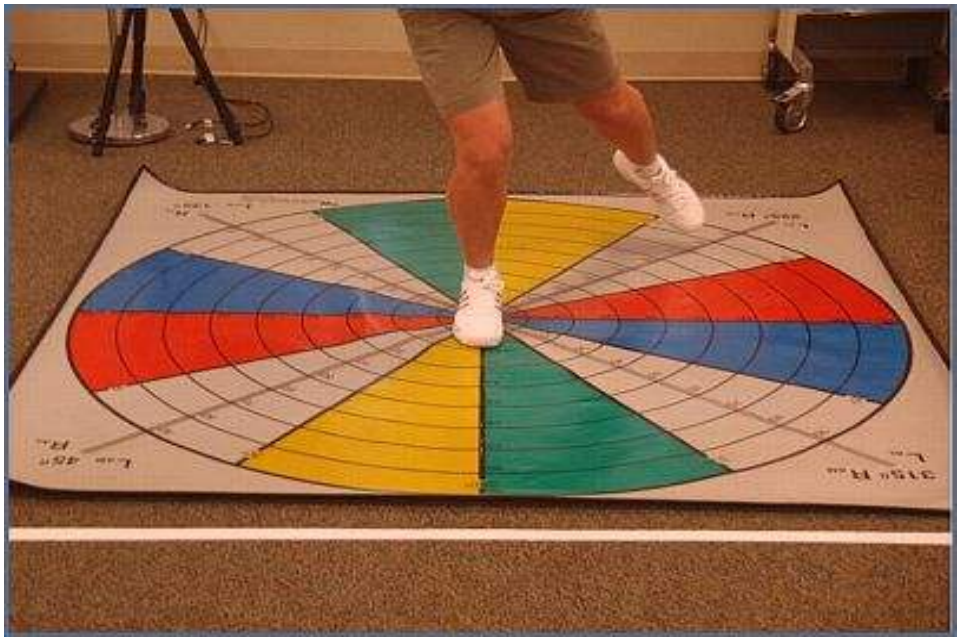
- *Squeeze test*: Athlete lays supine, hips flexed to 45° and knees flexed to 90°. The examiner places his or her fist between the patient's knees and instructs the patient to squeeze maximally. Reproduction of the patient's pain is a positive test for AP. The probability of detecting AP with a positive test is

increased 4 times.

- *Single Adductor*: The patient is supine and flexes the test leg to 30°. The examiner places their hand on the medial aspect of the patient's heel and instructs the patient to resist the examiner's attempt to abduct the patient's hips. Repeat on other side. Reproduction of the patient's pain regardless of the lower extremity tested is a positive test for AP. The probability of detecting AP with a positive test is increased 2.7 times.
- *Bilateral adductor*: The patient is supine with both hips flexed to 30°, slightly abducted, and slightly internally rotated. The examiner places their forearms on the patient's medial foot arches and instructs the patient to resist the examiner's attempt to abduct the patient's hips. Reproduction of the patient's pain is a positive test for AP. The probability of detecting AP with a positive test is increased 8 times. The clinician is more likely to find weakness of the adductor group (when compared to the abductor group) and pain with either the squeeze or bilateral adductor test.
- *Active Straight Leg Raise*: The patient is supine with legs 20 cm apart and asked to raise one leg while rating the difficulty of the lift. The process is repeated on the opposite leg (this can be done multiple times per side). A belt is placed securely around the pelvis and each leg lift is repeated and the patient is asked whether the lift was more difficult, as difficult, or easier than the lifts without the belt. If the patient has less pain or can produce greater force in the leg lift with a stabilizing pelvic belt in place, then the patient with AP has impaired load transfer through the pelvis due to instability in the pelvic ring – think SI joint and/or pubic symphysis dysfunction.

PHYSICAL PERFORMANCE MEASURES

- *Star-Excursion Balance Test (SEBT)* or the *modified SEBT (Y balance test)*: The test is performed with the patient standing on one leg at the center of the "star". While maintaining single leg stance, the patient reaches with the free limb in eight different directions (starting anteriorly and progressing clockwise) in relation to the stance foot. The SEBT requires lower extremity coordination, flexibility, strength and balance (see picture below).
- *Single leg hop tests*: These tests have been predominantly studied with ACL-injured population but can be used in any athletic population as functional screen. The vertical hop, single hop for distance or timed side hop can show deficient limb symmetry. The single hop for distance is a useful tool to identify persistent deficits in lower limb performance including functional power, force attenuation, and postural stability in athletes. The recommend minimum limb symmetry index (LSI – difference between legs) should have a value of > 90% prior to reintegration into sport. One additional single leg hop test that is helpful for clinicians is the triple hop for distance, which has been reported to have a large effect size.
- *The modified agility T-test (MAT)*: This test is used to evaluate side to side differences in lower extremity agility performance specific to cutting and running maneuvers. The MAT is a timed performance test utilized for sports that require quick starts, dynamic changes in direction, and efficient movement. The test is designed to incorporate four, 90-degree cuts isolated to a single direction during the trial to evaluate a potential unilateral deficit. The goal of the athlete is to attain symmetry within 10% in the time taken to complete the task.



MUSCULAR DYSFUNCTION IN ATHLETIC PUBALGIA

Within the authors' definition of AP falls tendinopathy of the adductor group or the abdominal group. Therefore, typical tendinopathy treatment would be necessary in these cases, including modality treatments, targeted soft tissue work, eccentric muscle loading and range of motion exercises.

They also remind us that even though pain might stem from a tendinopathy, the root cause of AP might be due to instability of the pelvic ring. This is where incorporation of a strength and stability program can be instrumental in properly transferring load from the lumbosacral region to the hip and prevent future reoccurrences. It is recommended that a strengthening program is implemented for the hip adductors, rectus abdominus, abdominal obliques, and transverse abdominus.

Muscular strength ratio is also important in the management of AP patients. The patient should be able to achieve pain-free adductor strength of at least 80% that of the abductors. While the non-dominant leg may be less strong than the dominant, the adductor-to-abductor strength ratios should not differ much between legs.

The specific intervention sequence is beyond the scope of this review. For an in-depth discussion on AP intervention I would encourage you to take a look at the last section of this paper along with Delitto's paper on the treatment for low back pain (1).

Additional References

1. Delitto, A., Erhard, R. E., & Bowling, R. W. (1995). A treatment-based classification approach to low back syndrome: identifying and staging patients for conservative treatment. Physical Therapy 1995; 75(6): 470-485. Discussion 485-479.