Case report

Unusual case of chronic tear of the Iliacus and Rectus Femoris muscle origins in old age.

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Abstract:
To highlight and report the occurrence and the radiological features of chronic avulsive muscle tear in a moderately built 57 year old male patient with history of slip and fall and chronic pain in the right hip. We describe the role of MRI in diagnosing the case with chronic partial avulsion tear of the right iliacus and the right proximal rectus femoris muscles as an approach to management and rehabilitation of multiple tears of the hip muscles.

Keywords: non-athlete, trauma, avulsion, intrasubstance tear, physiotherapy

Introduction:
Injuries of the iliopsoas muscle and intra-substance tendinous tears of the proximal rectus femoris muscle occur in young athletic individuals during activities like sprinting and kicking sports.1 This type of muscle injuries rarely occur in non-sportsperson. Very few cases are reported in medical literature describing the tear of iliacus and rectus femoris muscles. This kind of injury in a person with no pre-existing disease is unique. Nil cases are reported in literature to limelight on the interesting MRI findings of the combined tear of the iliacus and proximal rectus femoris muscle.2

Case History:
A 57 year old male presented to the hospital with complaints of low back and hip pain. He had a past history of slip and fall in the bathroom 6 months before following which he took analgesics and continued routine daily activities. After 10 days he reported to a hospital and there was no evidence of fracture in X-ray hip and pelvis. With prolonged use of medications the patient had temporary relief but later developed severe low backache and restricted hip movements. Hence MRI hip was advised to rule out the cause of chronic pain which was helpful in diagnosing chronic partial avulsion tear of the right iliacus muscle at its insertion and chronic partial intrasubstance tear of the right rectus femoris muscle at its origin possibly due to lack of bed rest and muscle over activity.
Figure 1: MR T2 weighted coronal image of the hip shows A) thickening of the right rectus femoris indirect head tendon at anterior inferior iliac spine origin, B) Chronic partial intra-substance tear with mild inhomogenous signals within the tendon, C) with adjoining fat interstitial edema.

Figure 2: MR T2 weighted coronal image of the hip shows hyperintense signals indicating edema around the rectus femoris muscle origin on the right side. Normal findings on the left side.
Figure 3: MR T2 weighted axial image shows partial avulsion and retraction of the outer iliacus muscle fibres at its insertion on the right side. Note that the iliacus appears partially torn and bulky at its origin on anterior inferior iliac spine.

Figure 4: MR T2 weighted axial image at the level of hip joint shows partially retracted iliopsoas muscle fibres indicating grade II tear. The retracted fibres are replaced by fat because of chronic tear.

The patient was treated conservatively since there were no signs of hematoma in the muscle fascia and hence the patient was treated non-operatively. Bed rest was advised to reduce stress on the hip until symptoms decreased. Regular physiotherapy for 3 months and functionally based therapeutic exercises like stretching of the hip and thigh muscles were done for successful correction of muscle dysfunction.

Discussion:
Iliopsoas has three muscles units: psoas major, psoas minor and iliacus. The iliacus arises from the iliac crest and the anterior inferior iliac spines, fills the iliac fossa and ends as a direct muscular attachment onto the lesser trochanter of the femur. The iliopsoas is a strong flexor of the hip joint. The psoas major has the ability of higher amplitude movement and the iliacus provides higher strength of the movement. The iliopsoas is important for walking and running and palsy of which disables locomotion, so it is considered to be one of the most important muscles in the body.

Acute iliopsoas muscle pain is usually caused by inflammation of the muscle insertion, ruptured belly of the muscle and the intramuscular hematoma. Partial iliopsoas tendon tears occur with athletic injuries and falls and complete iliopsoas tendon tears are most common in elderly women. Isolated iliopsoas tendon rupture is uncommon and causes include athletic injuries (cyclists, football players or those practising taekwondo), trauma, senility, complications from total hip arthroplasty, chronic diseases (e.g., rheumatoid arthritis, diabetes, hyperparathyroidism, chronic renal failure, obesity) and chronic corticosteroid therapy. Tendon tears rarely can be associated...
with an intraarticular hip infection like abscess which extends via the iliopsoas bursa into the iliopsoas tendon. The injuries of the iliopsoas muscle occur quite seldom and the development of radiological imaging techniques like MRI and musculoskeletal sonography generates more accurate diagnosis of any pathology. Imaging features of partial tendon tear are fluid collection within a portion of the tendon or focal discontinuity of the tendon fibers close to the lesser trochanter attachment. Complete tendon tears will show complete discontinuity and various degrees of retraction with haematoma collection of the tendinous remnant. Underlying metastatic disease must be ruled out in adults with atraumatic lesser rochanteric avulsion injuries.

The rectus femoris is a long fusiform thigh muscle forming the anterior superficial portion of the quadriceps muscle. Its main functions include knee extension and hip flexion. The proximal rectus femoris has two tendinous origins: the direct head, arising from the anterior–inferior iliac spine and the indirect head, arising inferiorly and posteriorly from the superior acetabular ridge and hip joint capsule. The two heads join to form a conjoined tendon. The direct head constitutes the superficial part and the indirect head forms the deep part of the conjoined tendon called the intrasubstance.

Predisposing factors for proximal rectus femoris tear include insufficient warm-up exercises, overall poor muscle conditioning, muscle fatigue due to overuse syndromes and previous tear. Acute deep musculotendinous junction injuries presents as sudden onset of thigh pain and a tearing sensation. Persistent pain, tenderness and rectus femoris asymmetry may also be associated. A discrete anterior thigh mass related to muscle retraction can be mistaken for a soft-tissue neoplasm. In a chronically inflamed and degenerated tendon low stress loading of the myotendinous junction itself causes complete muscle rupture. Deep musculotendinous junction injuries of the proximal rectus femoris are difficult to clinically diagnose because of the deep location of the injury and associated nonspecific physical findings. Muscle strain is clinically graded as first degree (stretch injury), second degree (partial tear), and third degree (complete rupture). First-degree strain on T2-weighted and STIR images shows high-signal-intensity due to edema and hemorrhage that surround the myotendinal junction and spreads into the adjacent muscle by tracking along muscle fascicles to create a feathery pattern. On TI-weighted images, the muscle and tendon may appear entirely normal because the myotendinous unit heals completely. Second-degree strain MR images show irregular thinning and mild laxity of tendon fibers. Tendon retraction and muscle bunching may be minimal or absent because the myotendinal junction remains partially intact. Here the muscular edema and hemorrhage collection between the fascial planes of muscles are more prominent. Hematoma at the myotendinal junction is pathognomonic of second-degree strain. In acute injury, the hematoma may show a peripheral high-signal-intensity rim (due to extracellular methemoglobin) on TI-weighted images and heterogeneously decreased signal intensity on T2-weighted images. Later, the hematoma decreases in size and develops a characteristic central fluid collection surrounded
by a rim of low signal intensity due to hemosiderin deposition and scar formation. Third-degree strain MR images show extensive hemorrhage that obscures visualization of anatomic structures and creates difficulty in differentiation of complete myotendinous rupture from large partial rupture. In non-athletes, conservative management to restore the muscle strength and range of motion is done for grade I and II strains. Professional athletes require further intensive physical therapy to avoid reinjury. Surgical intervention is required for grade III strains for evacuation of hematoma to avoid muscle atrophy and fatty infiltration.

References: