

Test yourself: Inability to squat

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Answer: Gluteus maximus contracture

Discussion

The gluteus maximus muscle is quadrilateral in shape with fibers extending in an oblique fashion from superomedial to inferolateral. In its upper portion the muscle attaches to the gluteal surface of the ilium, gluteal aponeurosis, sacrotuberous ligament, dorsal aspect of the sacrum and upper portion of the coccyx. While most of its fibers blend with the iliotibial tract, some of them insert onto the gluteal tuberosity of the proximal femur [1, 2].

Gluteus maximus contracture (GMC) is a disabling condition in which the patients present with physical deformity and limitation in the movements of the adjacent hip joint [1]. An association between intramuscular injections and the formation of a fibrous cord in GMC cases has been defined [2]. It is not well known why these intramuscularly injected patients have a propensity to develop this entity. A congenital form is also described based on the observation of this process in siblings and parents, although the inheritance pattern is poorly understood.

In GMC, some of the muscle fibers are replaced by a fibrous cord causing restriction in contractility of the muscle, which eventually leads to deterioration of the normal anatomy and function of the hip joint. As a result, the hip joint goes into

an abduction and external rotation position. The patients can only squat in a frogleg position with the legs being wide apart and they are unable to cross their legs [3]. Flattening of the buttock on the affected side may be seen secondary to the atrophy of the muscle fibers accompanying the fibrosis. These findings of an atrophic gluteus maximus muscle with a hard cordlike mass in the buttock may be palpated as well. Although with these clinical findings the diagnosis is straightforward, MR imaging may display the extent of the fibrosis and the degree of muscle atrophy, which are important determinants in choosing the appropriate treatment approach [4]. Passive stretching and manipulation may be of no value in treating the deformities in severe contractures where surgical release may be a requisite [4].

The primary findings on MR images that suggest GMC are atrophy involving mainly the upper portion of the muscle and an extending fibrous cord. The fibrous cord may be thick or thin, replacing the muscle fibers in their normal anatomic route as described before. This preferential atrophy and the existence of a fibrous cord help distinguish the process from other entities occurring with diffuse atrophy such as disuse, denervation and chronic inflammatory myopathies [1]. The secondary findings are posteromedial retraction of the thick iliotibial tract, abnormal external rotation of the affected hip and asymmetry of the supra-acetabular ilium as compared with the opposite side; however, the disease can affect both gluteus maximus muscles [4].

The diagnosis of GMC and the proposed disease classification based on the severity of manifestations and anatomic changes rely mainly on clinical examinations. MR imaging may play a role in aiding the diagnosis and displaying the extent of the disease. Although no comparative studies have evaluated the degree of clinical abnormality in relation to MR

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imaging findings, this issue may be an inspiration for future studies. MR imaging may also help to exclude the diagnosis of a fibromatosis or a posttraumatic hemosiderin deposition in contrast to cord-like, homogeneous, low-signal-intensity fibrotic lesions with surrounding muscle atrophy and characteristic physical deformities in GMC cases.

In conclusion, muscle atrophy in combination with an intramuscular fibrous cord of gluteus maximus muscle on MR images supports the clinical diagnosis of GMC, which can lead to early treatment with possible functional improvement.

The author declares that she has no conflict of interest.

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