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"Surgical Importance of Gluteus Maximus muscle " - A Literature Review"

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Abstract:

Gluteus Maximus muscle is the largest and heaviest muscle in the body. It is the most superficial of all gluteal muscles that are located at the posterior aspect of the hip joint. It is the largest muscle at the hip representing 16% of the total cross-sectional area.

The gluteus maximus muscle exhibits four actions on the hip joint; extension, external rotation, abduction and adduction of the thigh. When its proximal attachment is fixed, gluteus maximus acts as the main extensor of the hip joint, pulling the shaft of the femur posteriorly.

The gluteus maximus is the largest muscle in the human body. It is large and powerful because it has the job of keeping the trunk of the body in an erect posture. It is the chief antigravity muscle that aids in walking up stairs

So, surgical importance of gluteus maximus is necessary to study. This article is focusing for surgical importance of gluteus maximus.

Keywords: Gluteus Maximus

Introduction:

The **gluteus maximus** is the main extensor muscle of the hip in humans. It is the largest and outermost of the three gluteal muscles and makes up a large part of the shape and appearance of each side of the hips. It is the

single largest muscle in the human body. Its thick fleshy mass, in a quadrilateral shape, forms the prominence of the buttocks. The other gluteal muscles are the medius and minimus, and sometimes informally these are collectively referred to as the **glutes**.[1]

Gluteus maximus covers all of the gluteal muscles except for the antero_superior third of the Glutes medius. The ischial tuberosity can be felt deep to the lower part of the Glutes maximus. When the thigh is flexed the lower border of Glutes Maximus moves superiorly, exposing the ischial tuberosity subcutaneously.[2]

The muscle is made up of muscle fascicles lying parallel with one another, and are collected together into larger bundles separated by fibrous septa.

It works with the semitendinosus and semimembranosus to extend the hip. When paralysis of the gluteus maximus occurs, the person feels difficulty standing up from the sitting posture without support. The gluteus maximus paralysis is more obvious in the case of muscular dystrophy.[3]

The gluteus maximus is responsible for stabilization and movement of the hip.

Aims & Objectives:

To study the surgical importance of Gluteus Maximus muscle.

Material & Methods:

Manual Searching & Collection.

The gluteus maximus is the largest of the gluteal muscles. It is also the most superficial, producing the shape of the buttocks.

Attachments: Originates from the gluteal (posterior) surface of the ilium, sacrum and coccyx. The fibres slope across the buttock at a 45 degree angle and insert onto the iliotibial tract and gluteal tuberosity of the femur.

Actions: It is the main extensor of the thigh, and assists with lateral rotation. However, it is only used when force is required, such as running or climbing.

Innervation: Inferior gluteal nerve. [4]

Functions:

- Chief extensor of the thigh
- Essential for maintaining an erect posture
- Lateral rotation of the thigh
- Abduction of the thigh

Blood supply: It receives blood supply from the inferior and superior gluteal arteries.[5]

Nerve supply: The gluteus maximus is supplied by the inferior gluteal nerve (root L5, S1 and S2). Cutaneous supply is mainly provided by L2 and 3.[6]

Discussion:

The gluteus maximus is involved in several sports, from running to weight-lifting.

In cultural terms, the glutes are often considered a symbol of health and strength, and aesthetically appealing. They frequently feature in artwork which seeks to emphasise and celebrate physicality, and the ability to move dynamically and powerfully. They are usually shown to be efficiently proportioned and prominent.[7]

Clinical Significance:

The 30-second chair-to-stand test measures a participant's ability to stand up from a seated position as many times as possible in a thirty-second period of time. Testing the number of times a person can stand up in a thirty-second period helps assess strength, flexibility, pain, and endurance,[7] which can help determine how far along a person is in rehabilitation, or how much work is still to be done.

The piriformis test measures flexibility of the gluteus maximus. This requires a trained professional and is based on the angle of external and internal rotation in relation to normal range of motion without injury or impingement.[8]

Gait:[9]

- gluteus maximus contracts at heel-strike, slowing forward motion of trunk by arresting flexion of the hip and initiating extension;
- when gluteus maximus is weak, trunk lurches backward (maximus lurch) at heel-strike on weakened side to interrupt forward motion of trunk;
- during normal walking, hip extension is primarily a function of hamstrings rather than gluteus maximus.

Surgical Intervention:

Buttock or gluteal augmentation is a procedure used to improve the volume, shape, and contour of the buttocks. Buttock augmentation can be achieved through fat grafting, (famously referred to as a Brazilian Butt Lift or BBL), silicone implants, or sometimes a combination of these two techniques.[10]

Gluteus maximus tear Treatment: Ice, elevation, and rest may be helpful. Most commonly, gluteus muscle injuries heal with time and no further treatment.

Abductor deficiency secondary to total hip arthroplasty or primary abductor disruption is a well-known cause of a Trendelenburg gait with associated pain and instability. The history, clinical exam, and supplementary imaging studies aid in establishing this diagnosis. Gluteus maximus transfer is a proven and effective treatment strategy for severe abductor deficiency.[11]

Inhibition of Glutes maximus: As mentioned by vladmir janda`s Glutes maximus is one of the phasic muscles that tend to be inhibited in our body by many causes :

1. Arthrogenic inhibition from the hip joint.
2. Tight iliopsosas which sends a reciprocal inhibition to Glutes maximus as in Posterior lower crossed syndrome.
3. Pain reflex inhibition either hip pain or lumbopelvic pain.
4. Stretched weakness of Glutes maximus.

Conclusion:

1. Knowledge of the surgical anatomy of the Gluteus maximus muscle is one of the surgical technique to approach the hip joint operative procedure especially posteriorly.
2. Gluteus maximus transfer is a proven and effective treatment strategy for severe abductor deficiency.

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