

THE GEM IN GASTROCNEMIUS: THE FABELLA -Anatomical and Radiological Perspective

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ABSTRACT

Background: Sesamoid bones are small seed like bones which can be found in the hand, knee, and foot. Their unique structure works to protect the tendon, and to increase its mechanical effect. Examples of sesamoid bones include the os acromiale, os styloideum, metacarpal and hallux sesamoids, patella, os trigonum, os calcaneus secundarius, accessory navicular, os peroneum, and os intermetatarsaleum. The Sesamoid bones are so named because they resemble a sesame seed. WE present a brief description about Fabella, a small Sesamoid bone occasionally found in the lateral head of Gastrocnemius muscle, its surgical and medical importance. Presence of Fabella can be confused with certain Orthopedic Problems.

KEY WORDS: SESAMOID; BONE; GASTROCNEMIUS; ACCESSORY; FRACTURES; SYNDROME.

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INTRODUCTION

They are bones that are embedded within a tendon, and are typically found in locations where a tendon passes over a joint. The functional significance of the sesamoid bones is that the presence of these bones which are usually embedded in the tendon serves to hold the tendon slightly further away from the centre of the joint this increases its movement, and stops the tendon from flattening into the joint as tension increases.

Presence of Fabella is a rarity. Most clinicians never see fabella in their life. Some orthopedicians while treating patients notice disease of this accessory bone after a lengthy investigations and ruling out other diseases. Besides Fabella itself can get involved in many diseases. For an Anatomist, Clinician and Orthopedician Fabella is a rarity. The article tends to describe the various aspects of fabella which are of general interest to everyone.

The fabella is a small sesamoid bone that resembles a seed and is seen along the anterior surface of the lateral head of the gastrocnemius muscle. It is usually small but in some cases it may be big, irregular of shape and have an abnormal density. Only people with a fabella also have a fabella fibular ligament that originates on the fabella and inserts onto the proximal end of the fibula. This ligament may take part in the stability of the knee joint. The bone may also be present close to the common fibular nerve. Gastrocnemius is one of the most important muscles of the lower limb. It belongs to the superficial compartment of calf muscles. They belong to the group of superficial flexors. Gastrocnemius, plantaris and soleus form the bulk of the calf. Gastrocnemius forms the belly of the calf. It arises by two distinct heads, connected to the condyles of the femur by strong, flat tendons.

The medial, larger, head is attached to a depression at the upper and posterior part of the medial condyle behind the adductor tubercle, and to a slightly raised area on the popliteal surface of the femur just above the medial condyle.

The lateral smaller head is attached to an area on the lateral surface of the lateral condyle and to the lower part of the corresponding supracondylar line. Both heads also arise from subjacent areas of the capsule of the knee joint. Sural nerve passes between two heads of gastrocnemius. Fabella is located in the lateral head of gastrocnemius.

Accessory bones should be considered to be normal anatomic variants. The Sesamoid bones are generally small, ovoid nodular bones, often small, found embedded within a tendon or joint capsule and discovered incidentally. Although accessory ossicles and sesamoid bones are generally considered clinically insignificant anatomic variations, they can become symptomatic. Traumatic conditions include acute fracture, stress fracture, and pseudarthrosis can affect these bones and can confuse a clinician. Rarely Neoplastic, arthritic conditions OR inflammatory and degenerative disorders can be associated with these bones.

The fabella is not commonly found and no data from Kashmir regarding the percent of the population it occurs is present.

The Fabella syndrome is a rare syndrome [1,2] which occurs at all ages but mostly in the early adolescence. Some of the symptoms are pain in the posterolateral region which hurts even more by full knee extension and because of compression against the femoral condyle there can be local tenderness. Most of these symptoms are the result of repetitive friction of the fabella over the posterolateral femoral condyle.

Fabella Syndrome:

In most cases the fabella does not hurt. If it does hurt, it is called fabella syndrome. It is recognized by a sharp pain, local tenderness, and intensification of pain in the area of the fabella by full extension of the knee. It can also cause pain during knee flexion, cross-legged sitting and

athletic activities. When the fabella is too close to the common fibular nerve, it can be the reason of tinglings, foot drop and steppage gait (while lifting a leg during walking the foot will hang with the toes pointing down. The person will have to lift the leg higher so that the toes don't scrape the floor.) Excision can be done in severe cases [3].

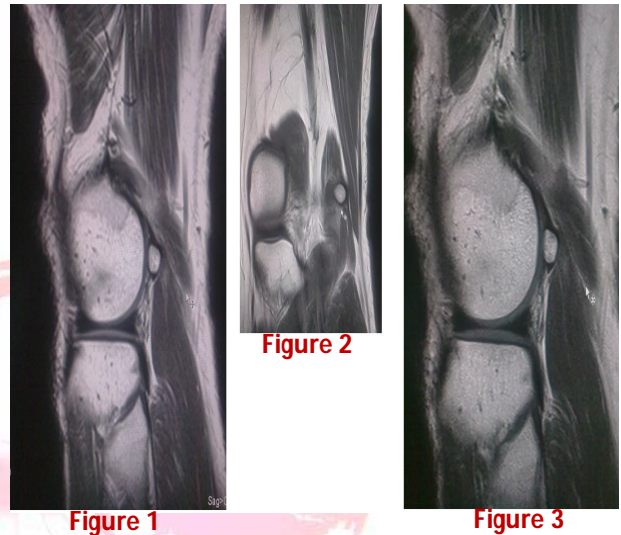


Figure 1: MRI Scan of a Patient with Os Fabella.

Figure 2: MRI Scan of a Patient with Os Fabella.

Figure 3: MRI Scan of a Patient with Os Fabella.

Diagnosis of postero-lateral knee pain and dysfunction can be difficult but is important for a good intervention. Baker's cyst, lateral ligamentous instability, meniscal tears, and proximal tibiofibular joint hypomobility should also be considered. There are other multiple anatomical structures that could be the source including postero-lateral corner structures, the ilio-tibial band and the biceps femoris tendon.

Irregular appearance of fabella may be confused with foreign body. On MRI it can appear like a posterior abnormality of the femoral condyle which sometimes can be interpreted as osteochondral defect or loose body. However this loose body is easy to differentiate from the fabella because the fabella moves away from the lateral femoral condyle during knee flexion.

It is of interest of the radiologist recognize the sesamoid bones of the foot and accessory ossicles [4] as well as differentiate them of an avulsion fracture. Accessory ossicles can suffer bone microtrauma, degenerative changes or other disorders that could lead to clinical entities.

Fracture characteristics

- Acute angle at fracture margin.
- Bone marrow edema on MR
- Jagged fracture plane.
- Nonsclerotic margin (if acute)

Accessory ossicle characteristics

- Accessory centers may be symptomatic, due to injury of synchondrosis between ossicle
- Another important point to consider is that normal variants may not be bilaterally
- Bone marrow edema sometimes present on MR if injured
- Obtuse angle at margin between ossicles
- Smooth, rounded margins
- Surrounded by cortex

CONCLUSION

A thorough Knowledge about Sesamoid bones is essential as they can be confused with fractures, secondary centres of ossification. Most importantly these bones can get involved in disease processes themselves.

Competing Interests: None

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