

**Anunusual case of isolated stress fracture of cuboid bone**

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**Citation this Article:** Shalmol Thomas M, Vagisha Vasudev, Nishchay Wuttshwar Tekulwar, G.Murugan, “ Anunusual case of isolated stress fracture of cuboid bone”, IJMSIR - June - 2024, Vol – 9, Issue - 3, P. No. 124 – 126.

**Type of Publication:** Case Report

**Conflicts of Interest:** Nil

**Abstract**

Cuboid isolated stress fractures are uncommon. Stress fracture has been reported in adults extremely infrequently, despite being significantly more common in youngsters. The cuboid, which is regarded as the cornerstone of the lateral column, is subjected to several stresses while standing and walking despite not being directly engaged in weight bearing. Because stress fracture symptoms are nonspecific and radiography is typically the first imaging modality employed, the identification of this problem is frequently delayed. It is commonly known that radiography has a low sensitivity when diagnosing stress fractures in the tarsal bones. Because the cuboid is located in the foot, it is particularly challenging to examine in three dimensions. Due to its higher spatial resolution computerized tomography imaging and magnetic resonance imaging (MRI) has been demonstrated to be more sensitive to the pathophysiologic alterations linked to stress-induced circumstances and to provide more specificity. This study aims to characterize the Radiological imaging characteristics of a cuboid stress fracture and to link

additional foot pathologic findings that can be connected to the fracture's development.

**Keywords:** MRI, CT scan, Cuboid

**Introduction**

One of the seven mid-and hind foot bones, the cuboid is situated most laterally in the distal tarsal row. Numerous ligaments support it as it articulates with the calcaneus proximally, the fourth and fifth metatarsals distally, and the navicular and lateral cuneiform medially. Because of the unique structure of the cuboid bone and its protected placement in the midfoot, cuboid fractures are uncommon and typically occur in conjunction with complicated foot injuries. A thorough clinical examination is necessary to diagnose these fractures, and as part of the differential diagnosis (especially when symptoms are unclear) all potential causes of lateral foot pain should be ruled out. Occult fractures might go unnoticed on conventional radiographs, leading to under diagnoses, particularly in younger patients. More research in this instance, such as computerized tomography or magnetic resonance imaging, might be

necessary. The specific fracture features determine how these injuries should be treated.

### Case Presentation

A 45 year old female present to the orthopaedic clinic with 3-day history of pain and mild swelling around lateral aspect of right hind foot and mid foot. Patient gives history of slip and fall which result in twisting of foot. On physical examination patient has tenderness around lateral aspect of right mid foot. On plane radiograph of oblique view of right foot cortical discontinuity was noted in the proximo-lateral corner of the cuboid bone of right foot. CT sagittal section at level of lateral midfoot shows a linear undisplaced fracture perpendicular to cortex of cuboid on the proximal lateral aspect with surrounding soft tissue edematous changes. MRI STIR sequence sagittal section at level of lateral midfoot shows a linear hypointense signal perpendicular to cortex of cuboid on the proximal lateral aspect with surrounding bone marrow edema. Patient was advised to immobilize the foot and managed with cast for 2 weeks. Non-steroidal anti-inflammatory drugs were prescribed for pain.



Figure 1: Plane radiograph oblique view of right foot shows cortical discontinuity at the proximal lateral aspect of cuboid bone.



Figure 2: CT sagittal section at level of lateral midfoot shows a linear undisplaced fracture perpendicular to cortex of cuboid on the proximal lateral aspect with surrounding soft tissue edematous changes.

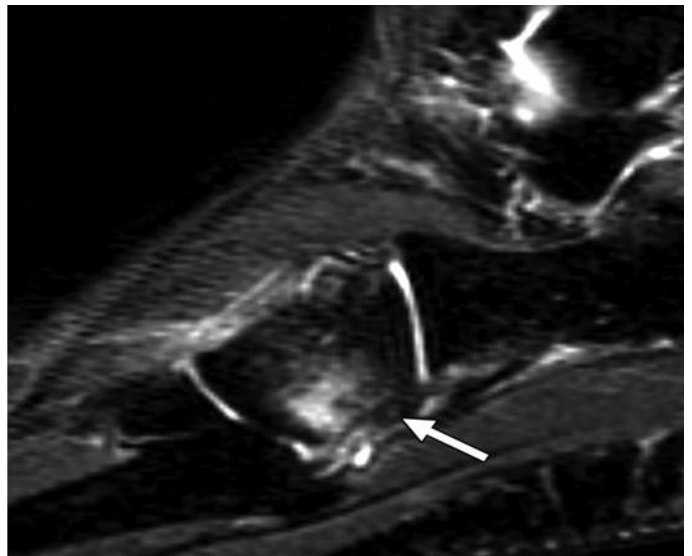


Figure 3: MRI STIR sequence sagittal section at level of lateral midfoot shows a linear hypointense signal perpendicular to cortex of cuboid on the proximal lateral aspect with surrounding bone marrow edema.

### Discussion

Cuboid fracture is a rare injury among which its isolated fracture is even rarer because of its protected anatomical location. Cuboid has central position in the lateral

column of foot. Anteriorly it articulates with base of fourth and fifth metatarsal bone, posteriorly with calcaneus medially with lateral cuneiform and non-articular surface are found in dorsal, plantar and lateral side. Its plantar surface has most important ligamentous attachment which includes calcaneo-cuboid ligament and long plantar ligament. A crucial anatomical component of the midfoot that significantly influences foot biomechanics is the cuboid bone. Cuboid fractures are typically linked to dislocations and complicated foot fractures. A significant degree of care must be given to these fractures to guarantee a prompt diagnosis. In addition to a thorough physical examination, additional radiological evaluation will determine whether or not there is a fracture. Simple cuboid fractures heal well with conservative care, but displaced fractures necessitate surgical intervention to prevent catastrophic outcomes down the road.

### Conclusion

Cuboid fractures due to the particular bone anatomy and its protected location in the midfoot are rare, and they are usually associated with complex injuries of the foot. Clinical examination to diagnose these fractures should be detailed and the differential diagnosis, especially in the case of vague symptoms, should include the exclusion of all lateral foot pain causes. Conventional radiographs do not always reveal occult fractures, which can be under diagnosed especially in children. In this case, further investigation including computerized tomography and magnetic resonance imaging may be required. The treatment of these injuries depends on the particular fracture characteristics.

### References

1. Pountos I, Panteli M, Giannoudis PV. Cuboid Injuries. *Indian J Orthop.* 2018 May-Jun; 52(3):297-

303. doi: 10.4103/ortho.IJOrtho\_610\_17. PMID: 29887632; PMCID: PMC5961267.

2. Angoules AG, Angoules NA, Georgoudis M, Kapetanakis S. Update on diagnosis and management of cuboid fractures. *World J Orthop.* 2019 Feb 18; 10(2):71-80. doi: 10.5312/wjo.v10.i2.71. PMID: 30788224; PMCID: PMC6379735.
3. Alan Lucerna, James Espinosa, Nicholas Butler, Ashley Wenke, Nicole Caltabiano. Nutcracker Cuboid Fracture: A Case Report and Review. *Case Reports in Emergency Medicine Volume 2018, Issue 1* 3804642.
4. Sarah M. Yu, Marcella Dardani, and Joseph S. Y. MRI of Isolated Cuboid Stress Fractures in Adults Volume 201, Issue 6.
5. Robert Casmus, MS, LAT, ATC and Kevin Burroughs, MD September 24, 2019 Nutcracker” Cuboid Fracture in a Collegiate Football Player
6. Alan Lucerna, James Espinosa, Nicholas Butler, Ashley Wenke, Nicole Caltabiano Nutcracker Cuboid Fracture: A Case Report and Review Volume 2018, Issue 1 3804642