

Case Report

Isolated traumatic dislocation of the cuboid

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Received: 04 June 2023

Accepted: 07 July 2023

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ABSTRACT

The cuboid bone stabilizes the lateral column of the foot. It articulates with the midtarsal and tarsometatarsal joints and this anatomically proportionates marked stability to the cuboid. Isolated dislocations of the cuboid a rare occurrence. The authors present a rare case of an isolated traumatic dislocation of the cuboid bone without fracture and present a short review of the pertinent literature.

Keywords: Cuboid dislocation, Foot trauma, Tarsal dislocation

INTRODUCTION

The cuboid bone stabilizes the lateral column of the foot. It articulates with the midtarsal and tarsometatarsal joints and this anatomically proportionates marked stability to the cuboid. This anatomic feature is reinforced by the multiple ligamentous, tendinous, and soft tissue attachments, making isolated dislocations of the cuboid a rare occurrence.^{1,2} There are few described cases in the literature. The authors present a rare case of an isolated traumatic dislocation of the cuboid bone without fracture and present a short review of the pertinent literature.

CASE REPORT

A 46 years-old female patient sought emergency care for falling from her height into a hole with an inversion and plantar flexion movement of her left foot, suggesting a lateral ankle sprain. She presented with marked swelling, pain in the lateral region of the hindfoot and functional impairment of the foot with antalgic gait.

An initial X-ray of the foot and ankle showed a suspected infero-medial cuboid dislocation (Figure 1). A computed tomography (CT) scan with 3D reconstruction was

conducted and an isolated cuboid dislocation, without associated fractures, was confirmed (Figure 2).



Figure 1: Initial X-rays, displaying the isolated cuboid dislocation.

A successful closed reduction was performed. Force applied in longitudinal traction of the 4th toe with gentle manipulation of the foot with direct pressure in the plantar projection of the cuboid was sufficient to reduce the dislocation, with immediate pain relief.



Figure 2: CT scan with 3D reconstruction better displays the cuboid dislocation.

A post-reduction X-ray confirmed the reduction and the patient was immobilized with a below knee cast for six weeks and was followed in biweekly appointments until six weeks (Figure 3).

Control X-rays and a control CT scan in the final appointment confirmed the stability of the reduction (Figures 4 and 5). The patient was then sent to physiotherapy and began the rehabilitation program.

At six months she returned to full-weight bearing.



Figure 3: Post-reduction X-ray.



Figure 4: Control X-ray at 6 weeks.



Figure 5: Control CT scan with 3D reconstruction at 6 weeks.

DISCUSSION

Isolated cuboid dislocations are rare and can often be misdiagnosed as ankle sprains at first presentation.¹ They may be a cause of chronic and persistent foot pain following an ankle sprain that does not respond to standard treatments.³

According to Sheahan et al, there are important signs to be observed in clinical presentation, such as acute and intense lateral hindfoot pain, palpable local gap over the cuboid usual anatomic position and the difficulty or incapability of weight bearing.²

Sometimes, the initial X-rays may be inconclusive. This may be caused by bone superimposition or eventually, in our opinion, due to the patient's pain making it difficult to correctly position the foot.² The authors agree with Sheahan et al that a CT scan, especially with a 3D reconstruction, should be performed in order to obtain the correct diagnosis and to exclude the possible associated fractures of the cuboid itself or the other bones.²

In the presented case, the authors didn't find any difficulty to perform and obtain closed reduction in the described manner, differently to Jacobsen and Sheahan, that had the necessity to do open surgical reduction.^{1,2} Fagel et al successfully achieved closed reduction of one case in the emergency room, despite not describing how it was performed.⁴

In a case report, Mazzotti et al observed during surgery that the plantar ligament apparatus was found to be almost intact, which turned the reduction easily performed.⁵ Eventually, this feature might have been one of the factors that helped our reduction.

Probably, because of the natural anatomic stability of the cuboid, also observed by Drummond and Hastings, when a severe injury happens, there may be anatomic structures interposed between the cuboid and the other bones, making closed reduction unsuccessful, as observed by Dobbs et al and Sheahan et al.^{2,6,7} In our case, by achieving

closed reduction, we could prevent the necessity of an anaesthetic procedure and a surgical intervention (or eventually more than one). Reyes et al also managed to obtain closed reduction in one case, but differently from us, they opted for percutaneous fixation with Kirschner wires, such as Sheahan et al.^{2,8} In other case report, Gough et al were able to obtain a stable closed reduction of a cuboid dislocation, but differently from us, they needed support of an anaesthetic procedure to perform the reduction.⁹

We stress the indication for a close follow-up, in order to avoid recurrence of the dislocation. Because of the lack of reported cases in the literature, it is not possible to foresee if the cuboid will dislocate again. Gough et al followed their patient for seven weeks without further dislocation.⁹ Fagel et al had a four week follow up also without complications.⁴ Sheahan et al kept the Kirschner wires for six weeks to allow for adequate ligamentous healing, stability and to prevent arthrofibrosis of the inherently mobile lateral column.² The authors followed the patient up closely and didn't observe any signs of redislocation neither complications at the final follow-up visit.

We agree with Sheahan et al and Zapf et al that cuboid dislocations must be properly assessed, because they can be misdiagnosed as ankle sprains and may become a cause of chronic foot pain.^{2,3} Proper X-rays and CT scans with 3D reconstruction may be the key to evaluate cuboid dislocations and are almost always available in emergency orthopaedic settings.

CONCLUSION

Consideration should be given to these injuries in cases of acute traumatic inversion and forced plantar flexion of the foot and ankle. On standard radiographs these injuries can be difficult to diagnose and in cases of high suspicion a CT scan with 3D reconstruction should be performed. Closed reduction by longitudinal traction to the lateral forefoot with direct pressure on the plantar projection of the cuboid may be the initial and successful treatment. If this does not work, one must consider surgical reduction under anaesthetic support, either closed or open, especially if it is hindered by soft tissue interposition.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

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Cite this article as: Alves MDPT, Nunes CFC, Modesto GMX, Madeira SAS. Isolated traumatic dislocation of the cuboid. *Int J Res Orthop* 2023;9:1050-2.