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## ***Os Trigonum Fracture: Case Report***

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### ***OBJECTIVE***

To present the case of an os trigonum fracture of a collegiate pole vaulter.

### ***MEDICAL HISTORY***

21-year-old male pole vault athlete was complaining of left lateral ankle pain after he missed his jump and fell on the pit inverting his ankle. He has a history of past ankle injuries. The athletic trainer at the site sent him for an X-ray to rule out a fracture which was negative. He left the hospital with crutches and an air splint to help with edema. Two days' post injury, patient had observable edema and ecchymosis and complained of sharp pain, tightness and popping between the lateral malleolus and Achilles tendon. Posterior drawer was positive for laxity and pain. Patient also had decreased plantarflexion and inversion.

### ***DIFFERENTIAL DIAGNOSIS***

Differential diagnosis included fracture, anterior talofibular (ATF) ligament sprain, or posterior talofibular (PTF) ligament sprain.

### ***PRE-TREATMENT***

The patient started an ankle rehabilitation the following day with basic range of motion exercises to decrease the edema. After each day of rehabilitation game ready was setup to continually decrease edema. Rehabilitation proceeded for the next two months decreasing edema, increasing range of motion and strength, but the patient continually complained of stiffness and slight pain between the lateral malleolus and Achilles tendon. He was sent to the physician at the health center where a magnetic resonance imaging (MRI) test was ordered. The MRI,

showed previous deltoid and anterior talofibular ligament sprains as well as lateral dome edema and there was no evidence of a fracture. Since the athlete continued to have discomfort, he was sent to an orthopedic surgeon where a formal physical examination were taken. The exam revealed noticeable swelling laterally, point tenderness in the posterolateral region of the ankle. The physician felt a loose body, so X-ray imaging was taken and revealed no evidence of talar dome injury, no evidence of an avulsion fracture of the medial malleolus or distal fibula. The lateral view of the x-ray showed a bony ossification, representing a fracture of the os trigonum. The physician recommended surgical excision of the os trigonum. Two weeks' post evaluation; the patient had surgery to excise the os trigonum.

### ***POST-TREATMENT***

After the examination from an orthopedic surgeon, a fractured os trigonum was confirmed and the athlete was set up to have surgery to excise the floating piece of trigonum. An exploration excision of the left ankle os trigonum was performed. The patient was prone during surgery and a tourniquet was placed on his left leg. An esmarch bandage was used to expel the patients' blood from the limb and then a C-arm was brought in to locate the area of the os trigonum. A curved incision was made posteriorly to the lateral malleolus and anteriorly to the Achilles tendon. The incision was made through the skin, subcutaneous tissue and into the fascia. A second longitudinal incision was made through the fascia into the fatty tissue. Retractors were placed within the wound so

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the os trigonum could be palpated. The os trigonum had broken off and formed a fibrous union. The os trigonum was then dissected and the fragment was removed. The talus was then cleaned up around the area the os trigonum had broken off. Range of motion exercises were performed to confirm if there were any other loose fragments along with C-arm confirmation. Once the C-arm showed no other bony fragments the wound was irrigated and the fascia, subcutaneous tissue and skin were sutured closed. Steri strips were placed over the incision and a compressive dressing was applied along with a sugar-tong splint. The tourniquet was removed and the patient was awakened.

Post-surgery, the patient was placed in a walking boot for four weeks with mild dorsiflexion and plantarflexion range of motion exercises to begin with. Inversion and eversion range of motions were initiated later after the walking boot was taken off. Basic range of motion and strength exercises were used before the patient could return to work and pole vaulting.

### **UNIQUENESS**

The patient was originally diagnosed with a PTF ligament sprain and was put on a treatment plan. It took three months to realize the patient had fractured his os trigonum because his injury presented as an ankle sprain. Os trigonum is often misdiagnosed as Achilles or peroneal tendonitis, tarsal tunnel syndrome or lateral ankle sprain.<sup>1</sup> The ossicle only presents within 10% of the population and usually occurs between the ages of 7 to 13 years. The ossicle usually fuses with the talus to form the Stieda process and when it doesn't fuse with the talus it remains as a separate ossicle.<sup>1</sup> Fracturing it is more unlikely, as it

usually occurs through excessive plantarflexion or from trauma.<sup>1</sup> It is often difficult to realize one has os trigonum as it usually is unnoticed unless symptoms are present. Athletes that are known to present with this ossicle are athletes who perform excessive plantarflexion like dancers, basketball players and runners.<sup>2</sup> The patients will complain of posterior ankle pain that worsens with plantarflexion or pushing off the ground.<sup>1</sup> common symptoms can include chronic pain, swelling and tenderness in the posterior aspect of the ankle.<sup>2</sup>

### **CONCLUSION**

A 21-year old male inverted his ankle during a pole vault. MRI and x-rays were taken revealing a fractured os trigonum. The patient had surgery to remove the ossicle. Eight weeks' post-operation the patient returned to pole vaulting. This case is important to the athletic training profession because a fractured os trigonum is highly unlikely, but still should be recognized. It is important for athletic trainers to be able to differentiate this injury from Achilles or peroneal tendonitis, tarsal tunnel syndrome or lateral ankle sprain because these injuries present similarly often resulting in misdiagnosis. If it is believed that a patient has os trigonum, the patient should be referred for physician evaluation and imaging.

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**KEY WORDS:** *os trigonum, fracture, ankle*