Os Trigonum/Posterior Impingement Syndrome and the Development of a New Clinical Test: Case Studies

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Introduction

- The purpose of this presentation is to identify the pathology and associated signs and symptoms of os trigonum/posterior impingement syndrome.
- This syndrome is currently under diagnosed.
- The case reports are of athletes at a Division III institution over a seven year period.
Introduction

- The os trigonum is an accessory ossicle located posterior to the posterior-lateral tubercle of the talus.
- Incidence ranges from 2.5 to 13 percent, and is mostly unilateral.
- The postero-lateral tubercle (especially if elongated) is prone to fracture during extreme plantarflexion.
- This is termed a Shepherd’s fracture, which is often difficult to differentiate from a true os trigonum.
- The postero-lateral tubercle is known as the trigonal (Stieds’s) process when it is fused to the talus. If the process remains unfused and separate, it is known as the os trigonum.
- In either case, the inferior surface typically articulates with the calcaneus and can be contused during inversion injuries.
Anatomy

- The os trigonum may have a fibrous, fibrocartilaginous, or cartilaginous attachment to the talus.
- A joint space may be identified between it and the posterior talus.
- Occasionally, the process may exhibit degenerative-like findings simulating osteoarthritis.
- The size of this ossicle ranges from small to large.
- It is best seen in the lateral view, but is infrequently viewed in the medial oblique view.
Mechanisms of Injury

- Injury mechanisms include hyperplantarflexion and/or inversion. Inversion injuries caused each of the injuries presented in these case studies.
- Since inversion was the mechanism of injury the posterior symptoms that can be associated with os trigonum syndrome were obscured by lateral ankle pain.
- Typical presentation includes vague posterior ankle pain, mild retrocalcanea edema, and pain increased with cutting activities.
- Both active and passive plantar flexion is painful (positive plantarflexion rock, or as Doug Mann has dubbed it, the Whedon test).
Case reports

- 2 football running backs
- 1 soccer fullbacks
- 1 soccer midfielder
- 1 football safety
- 2 soccer forward.
Case report #1:

- A 22 year old running back inverted his ankle with lateral symptomology that is typically associated with an inversion mechanism.
- There was also persistent posterior pain, especially with passive plantarflexion.
- Passive plantarflexion with supination and pronation (dubbed the Whedon test by Doug Mann) was positive.

WHEDON TEST: PASSIVE PLANTARFLEXION WITH INVERSION/EVERSION
Case report #2:

- A 19 year old fullback on soccer team was unsure of his injury mechanism, reporting that he “jammed” his foot into grass while cutting.
- Whedon test was positive.
- Athlete was taped in dorsiflexion with talar lock until the end of season.
- X-rays revealed an Os trigonum fracture which was surgically excised.
- Athlete played soccer the subsequent two seasons asymptotically.
Case report # 3:

- A 20 year old full back on soccer team who inverted his right ankle during the summer.
- Retrocalcaneal bursitis was the initial diagnosis, and he later developed Achilles tendonitis.
- This presumably masked the os trigonum syndrome.
- Whedon test was positive.
- Surgical resolution was achieved after the season.
Case report # 4:

- A 20 year old football running back who suffered a rotational injury on artificial turf.
- He complained of persistent pain upon planting to cut.
- X-rays revealed tibial and os trigonum avulsions.
- Whedon test was positive.
- Athlete was treated with dorsiflexion/talar lock taping, cortisone injection, therapeutic exercises and modalities.
- Surgical resolution was achieved after season.
- Athlete played asymptomatic the following season.
Case report # 5:

- A 24 year old midfielder on soccer team who was unsure of the injury mechanism.
- He had persistent posterior pain, a positive Whedon test, but did not like his ankle taped.
- Athlete was treated with cortisone injection, therapeutic exercises and modalities.
- The os trigonum was surgically removed after season.
- He played asymptomatic the following season.
Case study # 6:

- A 22 year old safety on football team with a history of recurrent left ankle sprains.
- After the anterior talo-fibular ligament healed, posterior pain persisted, Whedon test was positive.
- Athlete was taped, exercised, and injected, but he complained of persistent pain, especially upon deceleration.
- Surgical resolution was achieved in the post season. Athlete played next season without significant problems.
- Same athlete sprained right ankle 1.5 years later right before preseason. He developed posterior pain and had a positive Whedon test.
- Treated conservatively through season, when the condition was resolved surgically.
Case report #7:

- An 18 year old forward on the men’s soccer team who inverted his ankle while tackling the ball.
- He demonstrated posterior pain immediately upon Whedon test.
- X-ray revealed an intact Os Trigonum.
- Symptoms resolved with conservative treatment.
- He was asymptomatic in subsequent seasons.
Discussion

- These cases each presented initially as “run of the mill ankle sprains”, but did not resolve in the typical manner.
- The “Whedon” test was positive in each and demonstrated an impingement that was not consistent with soft tissue, as strength and active motions where not correlative.
Differential diagnosis

- Os supercalcaneum, which is extremely rare.
- Retrocalcaneal bursitis, yet the bursae is usually palpable.
- Achilles Tendonitis/nosus, in which passive plantarflexion is typically not painful.
- Posterior tibialis, peroneal, flexor hallucis tendinosus, with which passive plantarflexion is also not painful.
- Osteochondritis dissecans.
Conservative treatment

- Preventing excessive plantarflexion is helpful in reducing inflammation.
- This is achieved through calf flexibility, Anterior tibialis strengthening and taping for participation.
- The strapping is done in a manner that holds the foot in dorsiflexion with a “talar lock”.
- An injection of cortisone is appropriate if pain inhibits performance.
- This may calm down the inflammation for a month or so, hopefully for the duration of the season.
- An injection has contributed to a number of athletes successfully enjoying the season while anticipating future surgery.
Surgical treatment

- Typically surgery begins with a lateral incision.
- Superficial structures (eg: peroneal and Achilles tendons) are dissected and separated.
- The os trigonum is visualized and removed.
- Rehabilitation is conventional for ankle pathologies.
Conclusions

- Os trigonum syndrome is probably more prevalent than currently diagnosed.
- It can cause significant disability and performance impairment.
- While relatively simple to manage, recurrence of pain and disability may persist.
- Surgical intervention is both simple and effective.