

FOOT AND ANKLE UPDATE “3 COMMON CONUNDRUMS” BOA INSTRUCTIONAL COURSE 2020

Anna Chapman

Consultant Trauma & Orthopaedic Surgeon (Foot & Ankle)

University Hospital, Coventry & Warwickshire

TPD – Warwick Orthopaedic Specialist Training Programme



Acute TendoAchilles Rupture

Ankle Arthritis

Lisfranc Injuries

CASE 1: ACUTE TA RUPTURE

- 45 year old man
- Plays badminton for local club
- Played yesterday, thought he'd been kicked in the calf



ACHILLES TENDON RUPTURE - DIAGNOSIS



ACHILLES TENDON RUPTURE - DIAGNOSIS

- AAOS Guidance (2010)
 - Diagnose a rupture clinically with history and 2 of the 4 criteria
 - Positive calf squeeze
 - Palpable gap
 - Increased dorsiflexion on gentle manipulation
 - Decreased ankle plantarflexion strength
- Document Simmonds Triad
 1. Calf squeeze (Thompson's Test)
 2. Angle of declination
 3. Palpable gap



ACHILLES TENDON RUPTURE - IMAGING

- Will it change your management?



- USS useful if clinical picture is equivocal
- Dynamic USS has been used to assess the opposition of tendon ends to help determine who might benefit from surgery i.e. 1cm gap (Hutchinson & Topliss 2015, Lawrence & Robinson 2017)

Hutchinson, Topliss et al. The treatment of rupture of the Achilles tendon using a dedicated management programme. BJJ, 2015.

Lawrence, Robinson et al. Functional outcomes of conservatively managed acute ruptures of the Achilles tendon. JBJS, 2017

ACHILLES TENDON RUPTURE - MANAGEMENT

- Why would you want to treat it surgically?
 - Aim to minimise re-rupture rate
 - Restore correct length to tendon to potentially prevent weakness in push-off strength
 - If you are going to operate on it, how are you going to do it?
 - Experienced surgeon
 - Open
 - Percutaneous
-

ACHILLES TENDON RUPTURE - MANAGEMENT

- Why would you want to treat it conservatively?
 - Avoid all risks of surgery
 - Infection, wound breakdown, nerve injury
 - Less expensive
 - Time in functional orthosis the same as if surgery
 - How should you treat it conservatively?
 - NOT in a plaster
 - Treat with a functional rehabilitation protocol
-

WHAT THE HECK IS

“FUNCTIONAL REHABILITATION?”

- Supported by the basic science regarding phases of tendon healing
- Key components:
 - Immediate weight bearing mobilisation
 - Within an orthotic device
 - Early, but limited ROM permitted

Kearney & Costa, Current concepts in the rehabilitation of acute rupture of the TA, JBJS 2012

Mark-Christensen T, Troelsen A, Kalleose T, Barford KW. Functional rehabilitation of patients with acute Achilles tendon rupture: a meta-analysis of current evidence. Knee Surg Sports Traumatol Arthrosc 2016; 24: 1852-1859.

ACHILLES TENDON RUPTURE – EVIDENCE

- **Functional outcome is equivalent for operative vs. non-operative treatment** (Kearny 2015, Willits 2010, Metz 2008)
- Meta-analysis shows it is a trade off: (Ochen 2018):
 - Re-Rupture (2.3 % in op group vs. 3.9% in non-op) – LOW!
 - Complication (4.9% in op group vs. 1.6% in non-op)
 - Lower re-rupture rate after both early and late full WB – **safe** to WB & use functional protocols

Ochen et al, Operative treatment versus nonoperative treatment of Achilles tendon ruptures: systematic review and meta-analysis. BMJ 2018

Willits et al, Operative versus nonoperative treatment of Acute Achilles Tendon Ruptures – a multicentre RCT using Accelerated Functional Rehabilitation. JBJS 2010

AN EXAMPLE OF FUNCTIONAL REHABILITATION

- Patient fitted with a Vacoped boot ASAP after injury
- 3 weeks in 30 degree equinus weight bearing as tolerated
- -5 degrees every week to plantar grade
- At 10 weeks can wean out of boot
- Can start structured exercises at week 2-3 monitored by Physio – no stretches!
- Progressive loading from week 6-8 against resistance bands to body weight at 10 weeks then building as able to functional requirements

WORK WITH YOUR MDT / Physiotherapists

WHAT IS THE WORST THAT CAN HAPPEN?

- MANAGE EXPECTATIONS
 - A year to fully rehab
- The TA heals long?
 - Weak calf push-off
- The TA re-ruptures?
 - Then consider the risk of operative treatment as conservative has failed



You've always got the option of an FHL transfer later on down the line

FURTHER LEARNING?

- Look at and understand the protocol in your department
 - Speak to your Physiotherapists
 - Keep an eye out for UKSTAR results – coming soon!
-

CASE 2: ANKLE ARTHRITIS

- 73 year old lady, retired
- BMI 27
- Likes walking
- Limited to less than a mile
- Otherwise fit and well



ANKLE ARTHRITIS: ASSESSMENT

- Duration of symptoms
 - Walking distance
 - How is it limiting activities?
 - Systemic problems especially DM, DVT, RA, high BMI etc.
 - Smoking?
 - Conservative treatments

 - Pulses
 - Skin
 - Deformity
 - Surrounding joints
-

ANKLE ARTHRITIS: MANAGEMENT

Conservative

- Activity modification
- Reduction of BMI
- Brace
- Injection

Surgical

- Ankle arthrodesis
 - Open
 - Arthroscopic
- Total Ankle Replacement

ANKLE ARTHRITIS: MANAGEMENT

Ankle fusion is the gold standard treatment for ankle OA

ANKLE ARTHRITIS:

WHAT IS GOOD ABOUT A FUSION?

- Predictable results
 - Technically straightforward (unless major deformity)
 - Minimally invasive (arthroscopic)
 - Relatively inexpensive (especially if using 2 screws)
 - Everyone does them
 - Should last a lifetime
 - Safer: Can be done for most patients – e.g. high BMI, AVN, diabetes
 - Can be done for “young” patients

 - BUT: loss of ankle ROM, risk of arthritis in neighbouring joints, not all happy with a stiff ankle & change of gait
-

ANKLE ARTHRITIS:

OPEN VS. ARTHROSCOPIC FUSION

- Best available evidence demonstrates that arthroscopic ankle fusion may be associated with a higher fusion rate (94%) compared to open fusion (90%) (Yasui 2016, Chandrappa 2017)
- Intact soft tissue envelope
- Rapid activation of bone healing cascade
- Shorter recovery period
- Can be done for much “frailer” patients

Arthroscopic fusion may not be suitable for significant (>10 degrees) deformities

Chandrappa et. al. Ankle arthrodesis-Open vs arthroscopic: A systematic review and meta-analysis. J Clin Orthop Trauma 2017

Yasui et.al. Ankle Arthrodesis: A systematic review of the literature. World J Orthop 2016

ANKLE ARTHRITIS:

WHAT IS GOOD ABOUT AN ANKLE REPLACEMENT?

- Preservation of ROM at ankle joint
- Potentially better function
- Minimises strains and stresses on adjacent joints
- Potentially better function
- “Quicker” recovery

- BUT:
 - Technically more challenging – GIRFT
 - Riskier for the patient
 - May need revision in a lifetime or if patient not happy

ANKLE ARTHRITIS: EVIDENCE FOR TAR

- TAR is emerging as a viable alternative for certain patient cohorts
 - Developers series
 - STAR >90% at 12 years (Kofoed 2004)
 - Experts series
 - STAR 85% at 8 years (Dhar 2009)
 - Mid Term results:
 - STAR 71% at 10 years, 45.6 at 14 years (Brunner 2014)
- BUT better outcome due to improved techniques and 3rd & 4th Generation implants: uncemented with UHWPE fixed or mobile bearing – no evidence of superiority

- Kofoed et al, STAR, Clin Orthop Rel Research, 2004
- Brunner et. Al, STAR 11-15 year follow up JBJS Am 2014

WHO MIGHT GET A TAR?

“A middle-aged or elderly patient with an anatomically aligned ankle and heel, whose ankle has relatively preserved range of movement that includes at least 5 degrees of dorsiflexion”

- Normal BMI
 - No co-morbidities
 - Low demand
 - Surrounding joint arthritis – or RA
 - Able to understand risks & “experimental” nature of procedure & risk of revision
-

WHO DEFINITELY DOESN'T GET A TAR?

- Less than 50
 - Arthritis secondary to neuromuscular disease
 - Ankle ROM less than 10 degrees
 - No arthritis in adjacent joints
 - Severe instability
 - Coronal deformity greater than 15 degrees
 - Significant medical co-morbidity
-

ANKLE ARTHRITIS: SUMMARY

- Fusion is the gold standard
 - TAR has potential – but monitor closely with NJR
 - Consent patients appropriately
 - Await results of TARVA trial
 - Aims to compare the clinical and cost-effectiveness of TAR against ankle arthrodesis
-

CASE 3: LISFRANC FRACTURE-DISLOCATION

- 46 year old woman
 - Slipped down a bank on a walk with her family
 - Foot injury
 - Otherwise well
 - Slightly high BMI
 - Non smoker
 - Works as a teacher
 - Seen in A&E with swollen foot, unable to WB
 - XR, BK POP and then fracture clinic
-

LISFRANC INJURIES: DIAGNOSIS

- Be suspicious!
 - History – flexion of foot, kerb, stairs etc.
 - Swollen foot – unable to WB – investigate until you're sure there is no injury
 - Low threshold for treatment
 - Full history from patient
 - Diabetes
 - Smoking
 - VTE
 - Occupation
-

LISFRANC INJURIES: IMAGING

- Radiographs:
 - Initial films will be NWB
 - Aim to get WB views at 1/52 or even 2/52 if no clear injury or ? unstable
 - CT
 - To delineate extent of injury
 - MRI
 - Occasionally helpful acutely
 - Stress views
 - In theatre, to help identify/delineate injury
-

LISFRANC INJURIES: PEARLS

There is no “one fits all” treatment for all Lisfranc injuries

Treat each one individually

LISFRANC INJURIES: THE EVIDENCE

- The wide breadth of injury patterns included within the Lisfranc category may introduce too much heterogeneity to conclude that a single procedure is superior in all instances.
- Level 1 evidence that Lisfranc injuries treated with acute arthrodesis have comparable outcomes when compared with ORIF, with less repeat procedures (Henning 2009)
- Finland registered in 2018 a prospective randomized national multicenter trial (Ponkilainen et al) to compare non-op, ORIF and primary arthrodesis for Lisfranc Injuries
- Good review paper: EFORT Open Review: Volume 4, July 2019
- Henning et al, ORIF vs Primary arthrodesis for Lisfranc injuries: a prospective randomised study. Foot and Ankle International 2009

LISFRANC INJURIES: MANAGEMENT

- Conservative
 - Stable injuries / minimally displaced
- Surgical - Usually takes at least 2 weeks for swelling to settle
 - Fixation
 - Fusion
- May extend into cuneiforms - Lisfranc variant
- Maintain mobility in lateral columns
- Just do what needs to be done

LISFRANC INJURIES: WHO GETS FIXATION?

- Minimal comminution
- Limited joint involvement
- Younger patients

How to fix?

- K-wires – only occasionally for 4th / 5th TMTJ as best to preserve mobility
 - Screws – damage to articular surface
 - Bridging plates – only remove the plates if irritating
-

LISFRANC INJURIES: WHO GETS A FUSION?

- Significant intra-articular comminution
 - Purely ligamentous injury (Ly & Coetzee 2006)
 - Older patients
 - Older injuries – delayed presentation or significant delay to surgery
-
- Ly & Coetzee, Treatment of primarily ligamentous Lisfranc joint injuries: primary arthrodesis compared with open reduction and internal fixation. A prospective, randomized study. JBJS (Am 2006)

LISFRANC INJURIES: SUMMARY

- Don't miss the injury
 - Treat each foot as it needs to be treated
 - Limited evidence – heterogenous group
-

IN SUMMARY

- For TA rupture, conservative treatment with functional rehabilitation offers equivalent outcomes to surgical treatment other than a very slightly higher risk of re-rupture with a lesser risk of complication
 - For the treatment of ankle arthritis, arthroscopic ankle fusion is the gold standard treatment, but TAR is emerging as a viable alternative in a selected group of patients due to improvements in patient selection, surgeon experience and implant design
 - For Lisfranc injuries, treat each injury as unique, balance all patient factors and injury patterns to determine whether fixation or fusion is the best option
-