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

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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
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• 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)


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 acture rupture of the TA, JBJS 2012

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

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

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