

CHALLENGING FOOT & ANKLE CASES IN SPORTS

EVIDENCED-BASED TREATMENT AND WHAT NOT TO MISS

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DISCLOSURES

- CONSULTANT – WISHBONE MEDICAL, INC.



- NO CONFLICTS OF INTEREST DIRECTLY RELATED TO THIS TALK

SPECIAL THANKS FOR SELECT IMAGES

- CHRIS CHIODO, MD
- ERIC BLUMAN, MD PHD
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- JOHN KWON, MD
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- JOSHUA VAUGHN, MD
- GREG GUYTON, MD




OUTLINE

- OBJECTIVES
- INTRODUCTION
- CASE PRESENTATIONS ON VARIOUS TOPICS
 - SELECT TOPICS
- SUMMARY OF KEY POINTS
- REFERENCES

OBJECTIVES

- -DESCRIBE COMMON SPORTS-RELATED FOOT AND ANKLE INJURIES THAT ARE OFTEN MISSED OR DELAYED IN DIAGNOSIS
- -BE ABLE TO IDENTIFY COMMON SPORTS-RELATED FOOT AND ANKLE PROBLEMS ON RADIOGRAPHS AND ADVANCED IMAGING
- -REVIEW PROPER INITIAL EVALUATION AND TREATMENT OF ANKLE SPRAINS AND ASSOCIATED INJURIES
- -TO REVIEW CURRENT LITERATURE REGARDING THE TREATMENT OF COMMON SPORTS AND ANKLE INJURIES THAT ARE MISSED
- -DISCUSS CURRENT RECOMMENDATIONS AND APPROPRIATE POST-OPERATIVE CARE, INCLUDING RETURN TO SPORTS EXPECTATIONS

- 
- “THE ART OF MEDICINE CONSISTS OF AMUSING THE PATIENT WHILE NATURE CURES THE DISEASE”

- -VOLTARE
- 

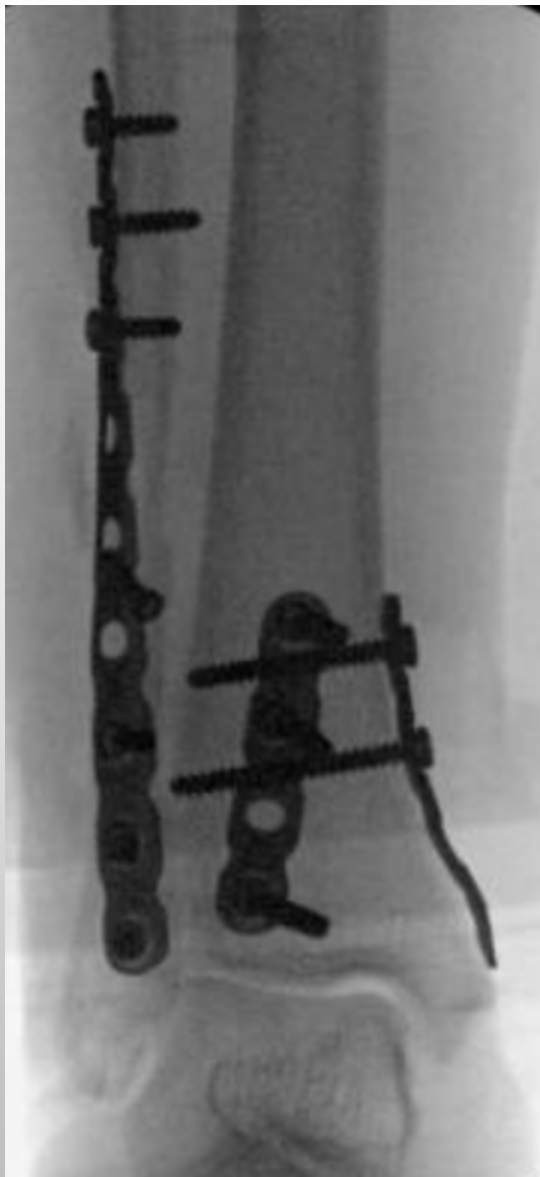
BUT WHAT HAPPENS WHEN MOTHER NATURE ON VACATION?



The background of the slide is a light gray gradient. It is decorated with several realistic water droplets of various sizes, primarily located in the top-left, top-right, and bottom-right corners. The droplets have highlights and shadows, giving them a three-dimensional appearance.

CHALLENGING FOOT & ANKLE CASES IN SPORTS





WHY WON'T MY ANKLE SPRAIN GET BETTER???



CASE PRESENTATION

- 20F PRESENTS AFTER AN INVERSION INJURY TO HER RIGHT ANKLE WHILE RUNNING
 - HAD IMMEDIATE PAIN/SWELLING, WENT TO URGENT CARE WHERE XRAYs OF THE ANKLE WERE NORMAL
 - SHE WAS GIVEN CRUTCHES AND AN ACE WRAP, AND TOLD TO FOLLOW-UP WITH AN ORTHOPAEDIC SURGEON IN A WEEK IF SHE WASN'T BETTER
 - DENIES PRIOR ANKLE INJURIES

WHAT IS WRONG WITH THIS STORY?

- SEEN AT URGENT CARE? – NO, THIS IS WHERE MOST PEOPLE GO
- XRAYs? – GOOD THEY GOT THEM, BUT NEEDS A WEIGHT-BEARING ANKLE FILM
 - FOOT FILMS?
- PLACED IN AN ACE WRAP? – IMMOBILIZATION PREFERRED
- CRUTCHES? – NWB IS ALWAYS THE DEFAULT
- TOLD TO FOLLOW-UP IN ONE WEEK IF IT ISN'T BETTER – (OR SOONER)

INTRODUCTION

- “ANKLE SPRAINS”
- TOP 3 MOST FREQUENT THINGS I SEE IN THE OFFICE
- MOST COMMON REASON FOR MISSED ATHLETIC PARTICIPATION
- MOST ARE TREATED NON-OPERATIVELY
 - RICE, BRACING, PT
- <10% DEVELOP CHRONIC ISSUES REQUIRING SURGERY



ANATOMY

- ATFL AND CFL
- PRIMARY RESTRAINT TO ANTERIOR TRANSLATION - ATFL
 - MOST COMMON LIGAMENT INJURED
- MORE SEVERE SPRAINS CAN INVOLVE THE CFL AND PTFL



GRADING OF SPRAINS

- I – NO LIGAMENTOUS DISRUPTION
- II – STRETCH WITHOUT TEAR
- III – COMPLETE TEAR

- IS THIS USEFUL?

USEFULNESS OF CLASSIFICATION SYSTEMS

- 1. ALLOWS YOU TO DESCRIBE AN INJURY FROM ONE MEDICAL PROFESSIONAL TO ANOTHER
- 2. HAS SOME PROGNOSTIC VALUE
- OTHERWISE ITS NOT PARTICULARLY USEFUL TO THE CLINICIAN

Arch Orthop Trauma Surg. 2013 Aug;133(8):1129-41. doi: 10.1007/s00402-013-1742-5. Epub 2013 May 28.

Treatment of acute ankle ligament injuries: a systematic review.

Petersen W¹, Rembitzki IV, Koppenburg AG, Ellermann A, Liebau C, Brüggemann GP, Best R.

Arch Orthop Trauma Surg.

RESULTS: Three meta-analysis and 19 articles reporting 16 prospective randomized trials could be identified. The main advantage of surgical ankle ligament repair is that objective instability and recurrence rate is less common when compared with non-operative treatment. Balancing the advantages and disadvantages of surgical and non-surgical treatment, we conclude that the majority of grades I, II and III lateral ankle ligament ruptures can be managed without surgery. For non-surgical treatment, long-term immobilization should be avoided. For grade III injuries, however, a short period of immobilization (max. 10 days) in a below knee cast was shown to be advantageous. After this phase, the ankle is most effectively protected against inversion by a semi-rigid ankle brace. Even grades I and II injuries are most effectively treated with a semi-rigid ankle brace. There is evidence that treatment of acute ankle sprains should be supported by a neuromuscular training. Balance training is also effective for the prevention of ankle sprains in athletes with the previous sprains. There is good evidence from high level randomized trials in the literature that the use of a brace is effective for the prevention of ankle sprains.

CONCLUSION: Balancing the advantages and disadvantages of surgical and non-surgical treatment, we conclude that the majority of grades I, II and III lateral ankle ligament ruptures can be managed without surgery. The indication for surgical repair should be always made on an individual basis. This systematic review supports a phase adapted non-surgical treatment of acute ankle sprains with a short-term immobilization for grade III injuries followed by a semi-rigid brace. More prospective randomized studies with a longer follow-up are needed to find out what type of non-surgical treatment has the lowest re-sprain rate.

ACUTE MANAGEMENT OF ANKLE SPRAINS

- IF NO FRACTURE, AND PATIENT CAN WEIGHT-BEAR, BOOT OR BRACE IMMOBILIZATION IS SUFFICIENT
 - ANKLE DORSIFLEXION RE-APPROXIMATES THE FIBERS OF THE LATERAL ANKLE LIGAMENTS
 - EARLY FUNCTIONAL REHABILITATION SHOWN TO BE BETTER THAN CONTINUED REST
- IF PATIENT CANNOT WEIGHT-BEAR, PLACE IN EITHER A SPLINT OR BOOT AND KEEP NWB WITH CRUTCHES UNTIL FOLLOW-UP WITH SPECIALIST
- IF YOU SPLINT, MAKE SURE TO SPLINT IN NEUTRAL DORSIFLEXION, AVOID SPLINTING IN INVERSION

SHOULD YOU GET AN XRAY?

- YES!
- OTTAWA ANKLE CRITERIA FOR FRACTURE
 - BONE TENDERNESS DISTAL 6CM OF TIBIA/MEDIAL MALLEOLUS
 - BONE TENDERNESS DISTAL 6CM OF FIBULA
 - INABILITY TO BEAR WEIGHT IMMEDIATELY AND FOR FOUR STEPS
- HIGH SENSITIVITY, MODERATE SPECIFICITY
- STUDIES DID REDUCE XRAYS BY APPROXIMATELY 30%, BUT NOT A HUGE COST SAVINGS
- NO CHANGE IN WHETHER OR NOT PATIENTS PRESENTED TO AN URGENT CARE OR EMERGENCY ROOM



CASE PRESENTATION (LW)

- 20F STUDENT AT A LOCAL UNIVERSITY SUSTAINED AN INVERSION INJURY TO HER ANKLE IN SEPTEMBER 2018
 - UNABLE TO BEAR WEIGHT INITIALLY
 - SEEN IN A LOCAL ED THAT WEEK, NWB ANKLE FILMS NEGATIVE
 - DISCHARGED WITH AN ACE WRAP
- PAIN IMPROVED OVER A FEW MONTHS, BUT STILL WAS PRESENT
- SLOWLY UNABLE TO RUN SECONDARY TO THE PAIN
- PRESENTED TO THE OFFICE 5 MONTHS AFTER HER INJURY WITH MILD ANTEROLATERAL TENDERNESS JUST PROXIMAL TO THE LATERAL ANKLE LIGAMENTS

CLINICAL EXAM

- NEUTRAL HINDFOOT ALIGNMENT
- MILD ANTEROLATERAL ANKLE TENDERNESS JUST PROXIMAL TO THE JOINT LINE
- DISTALLY NVI WITH GOOD STRENGTH
- MILD LAXITY TO ANTERIOR DRAWER TESTING
- THOUGHTS?



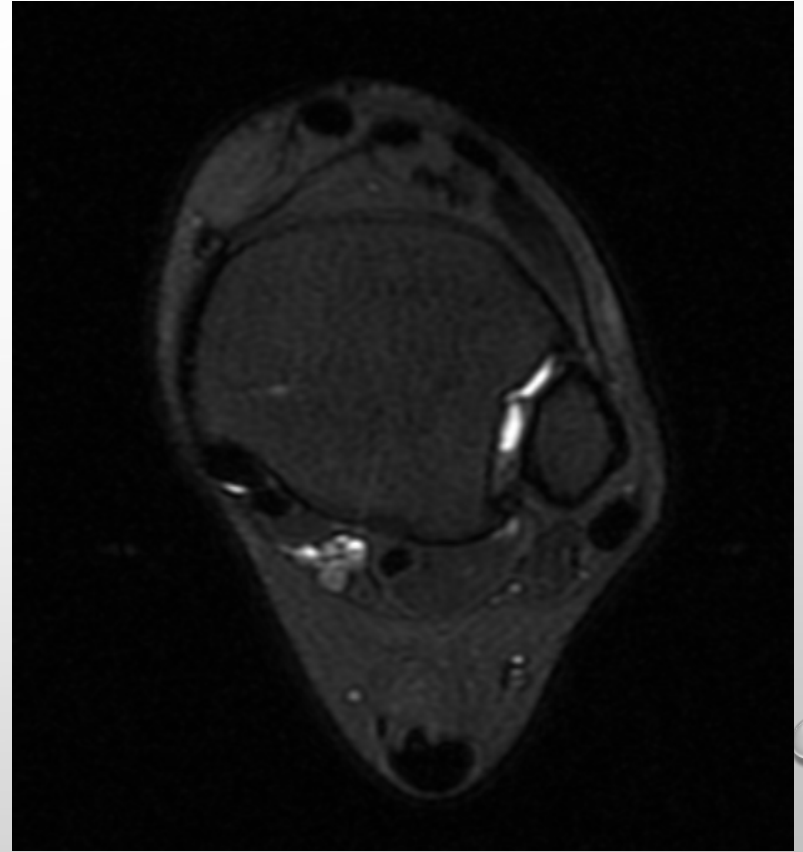
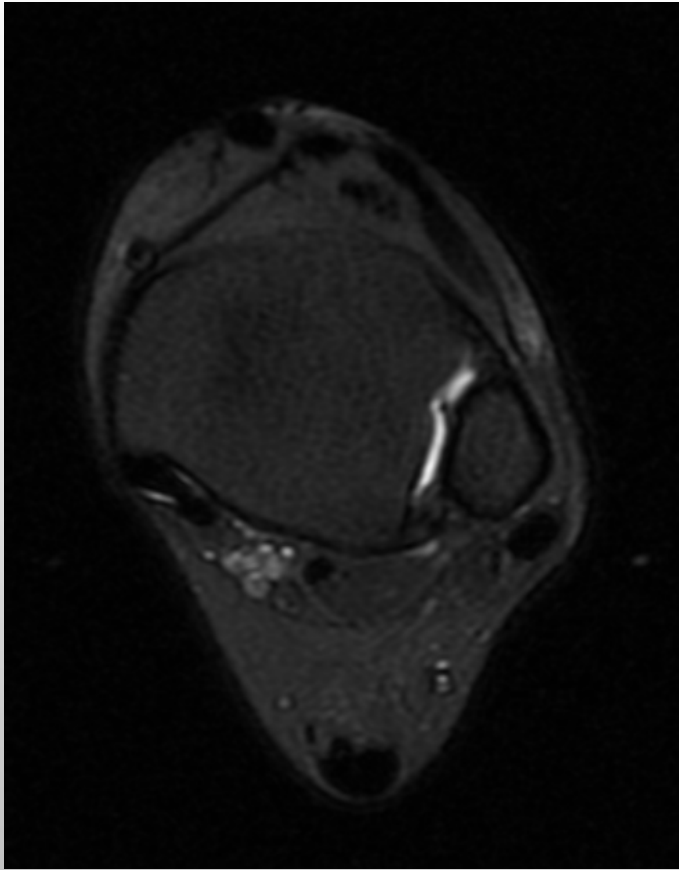




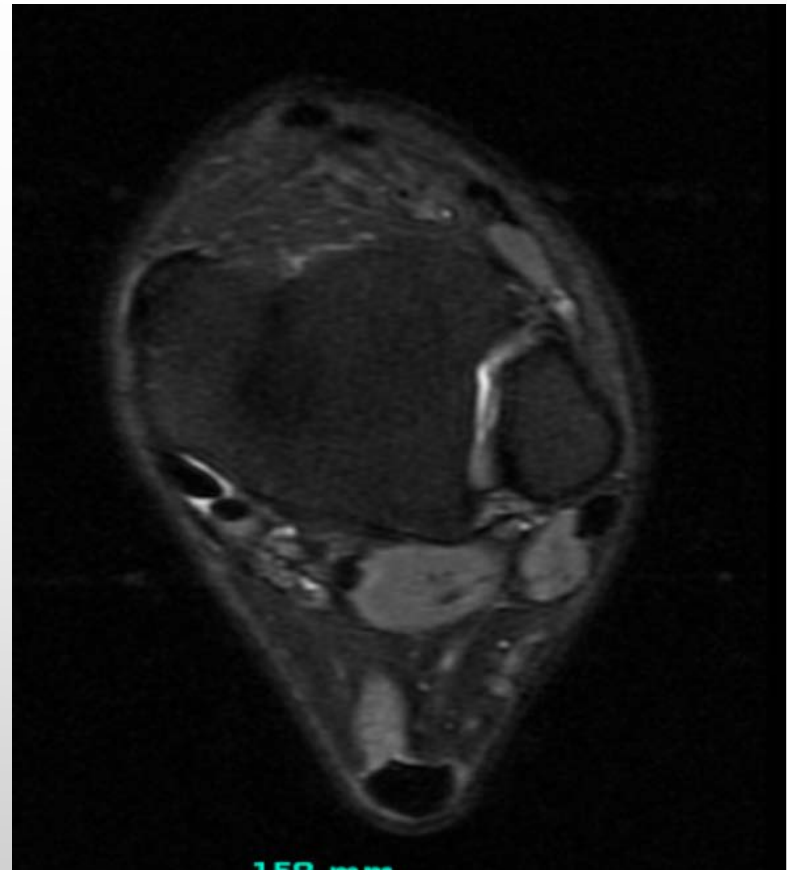
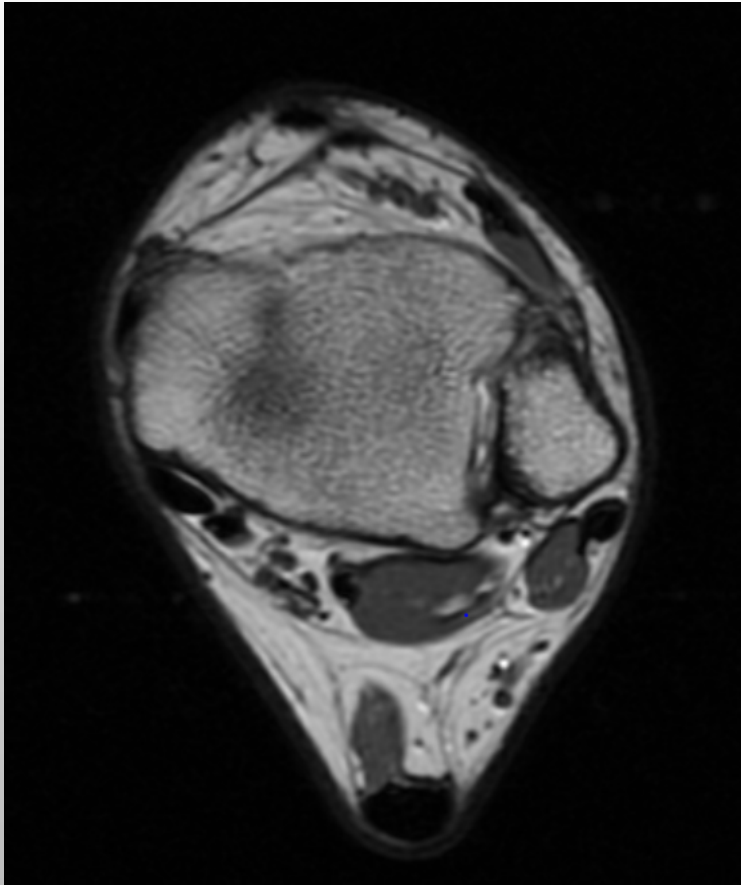
ADVANCED IMAGING

- CT?
- MRI?

MRI



35M EX-MILITARY WITH 2 YEARS OF ANKLE PAIN AFTER INJURY OVERSEAS



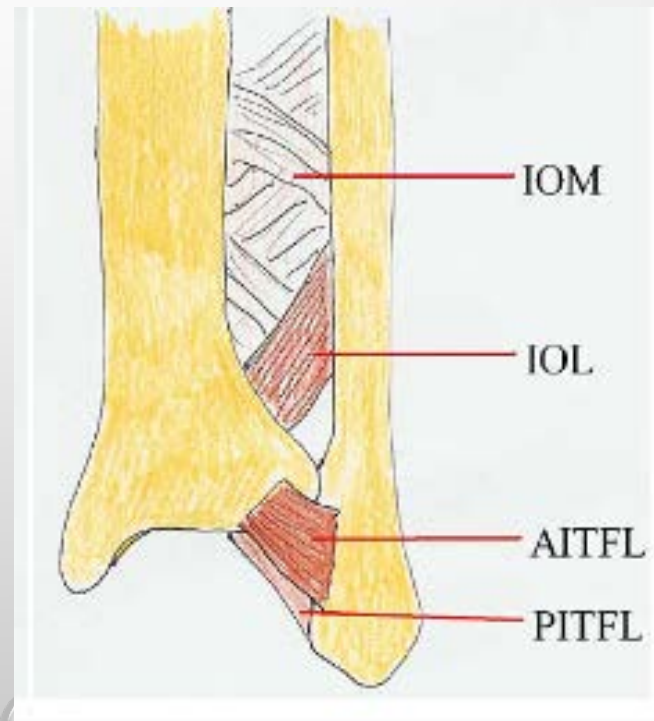


HIGH ANKLE SPRAIN

- INJURY OR PARTIAL DISRUPTION TO THE SYNDESMOSIS
 - 1-16 % OF ALL ANKLE SPRAINS, UP TO 25% IN SOME STUDIES
- TYPICALLY HIGHER ENERGY INJURIES
- TYPICALLY REQUIRE A LONGER PERIOD OF REHABILITATION AND LONGER TIME TO RETURN TO SPORTS
- RARELY NEEDS ACUTE SURGICAL STABILIZATION

SYNDESMOSIS

- THINK OF THIS AS A JOINT BETWEEN THE FIBULA AND TIBIA
- FIBULA SITS IN THE INCISURA
- COMPONENTS (~4)
 - AITFL
 - PITFL
 - IOL
 - IOM

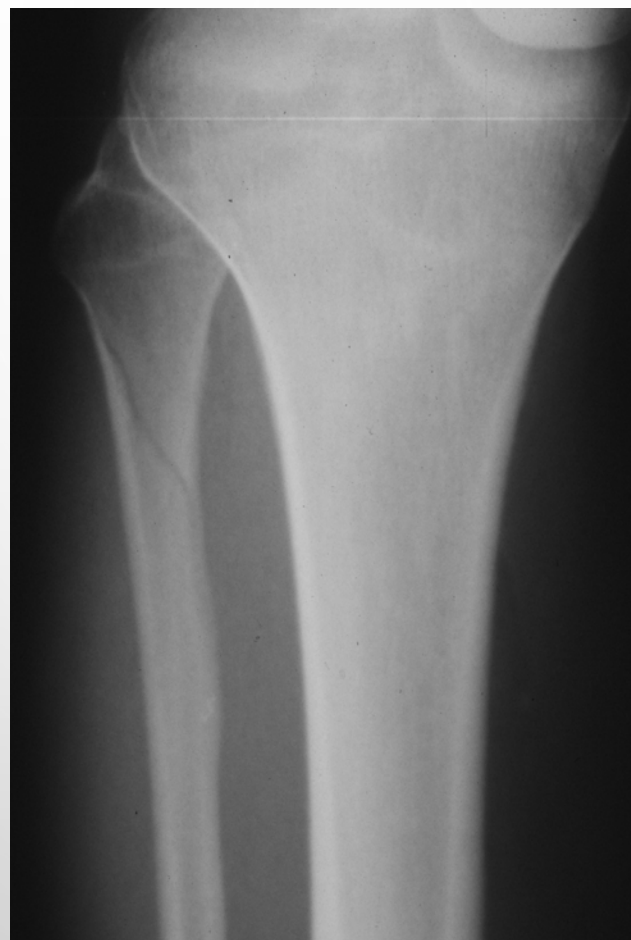


DIAGNOSIS

- ANTEROLATERAL PAIN JUST PROXIMAL TO THE LATERAL ANKLE LIGAMENTS (SYNDESMOTIC TENDERNESS)
 - USUALLY MORE SEVERE THAN AN ANKLE SPRAIN
- DIFFICULTY WEIGHT BEARING (MOST LATERAL ANKLE LIGAMENT SPRAINS CAN BEAR WEIGHT)
- POSITIVE SQUEEZE TEST
- EXTERNAL ROTATION STRESS TEST
- PAIN WITH FIBULAR TRANSLATION
- IMPROVES WITH CIRCUMFERENTIAL TAPING

IMAGING

- WB ANKLE FILMS (AP, LATERAL, MORTISE)
 - CAN BE VERY SUBTLE
- KNEE/TIB/FIB FILMS – LOOK FOR PROXIMAL FIBULA FRACTURE
- WB CONTRALATERAL FILMS FOR COMPARISON
- STRESS VIEWS CAN BE USEFUL (GRAVITY, ER STRESS)
- MRI – NEXT STEP IF CLINICAL SUSPICION IS HIGH BUT RADIOGRAPHS NOT DEFINITIVE (PREFERRED DIAGNOSTIC STUDY)
- CT - CAN SHOW RELATIONSHIP OF FIBULA IN THE INCISURA
 - MULTIPLE STUDIES SHOW UTILITY IN SPORTS MEDICINE CIRCLES



TREATMENT

- ACUTE INJURY – RICE, BRACING (BOOT), CONSIDER A PERIOD OF NWB
 - 2-3 WEEKS NWB IN A BOOT UNTIL PAIN FREE
 - NO LITERATURE TO SUPPORT
- SUBACUTE INJURY (>6 WEEKS) – NO GUIDELINES
 - MRI
 - PT/SURGERY
- CHRONIC
 - MRI
 - PT/SURGERY

Syndesmosis sprains of the ankle: a systematic review.

Jones MH¹, Amendola A.

+ Author information

Abstract

Syndesmosis sprains have received increasing recognition during recent years because of a heightened awareness of the mechanism, symptoms, and signs of injury. Syndesmosis injuries take longer to recover than lateral ankle sprains, and no consensus exists regarding optimal treatment of these injuries. Therefore, we undertook a systematic review of the literature to evaluate the effect of treatment on outcome following syndesmosis injury. We identified six articles that evaluated treatment of syndesmosis injuries. All studies were case series including prospectively collected data of young, active patients with a minimum of 6 months followup and represented the highest level of evidence available. Three specifically addressed patient outcomes at final followup: one indicated 44 percent of patients had acceptable outcomes, and two rated patient outcomes as good to excellent. Time lost from sport ranged from 0 to 137 days, with averages ranging from approximately 10 to 14 days up to 52 days. The studies did not employ consistent diagnosis or grading schemes, did not use uniform treatment protocols, and did not compare treatments. Therefore, this review generates several prospective areas for additional investigation rather than providing strong evidence to support a particular method of treatment.

- TIME LOST TO TO SPORTS VARIABLE (0-137 DAYS, AVERAGES AROUND 14-52 DAYS)
- 43 DAYS IN THE WEST POINT STUDY (6 WEEKS)

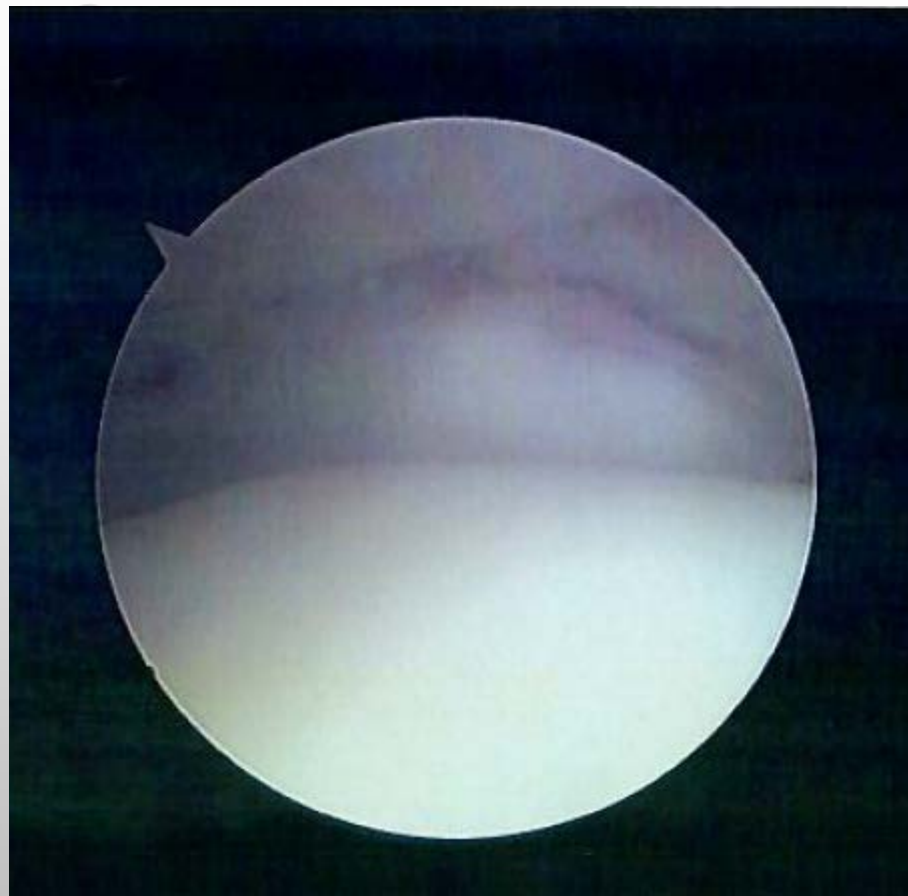
SURGICAL TREATMENT

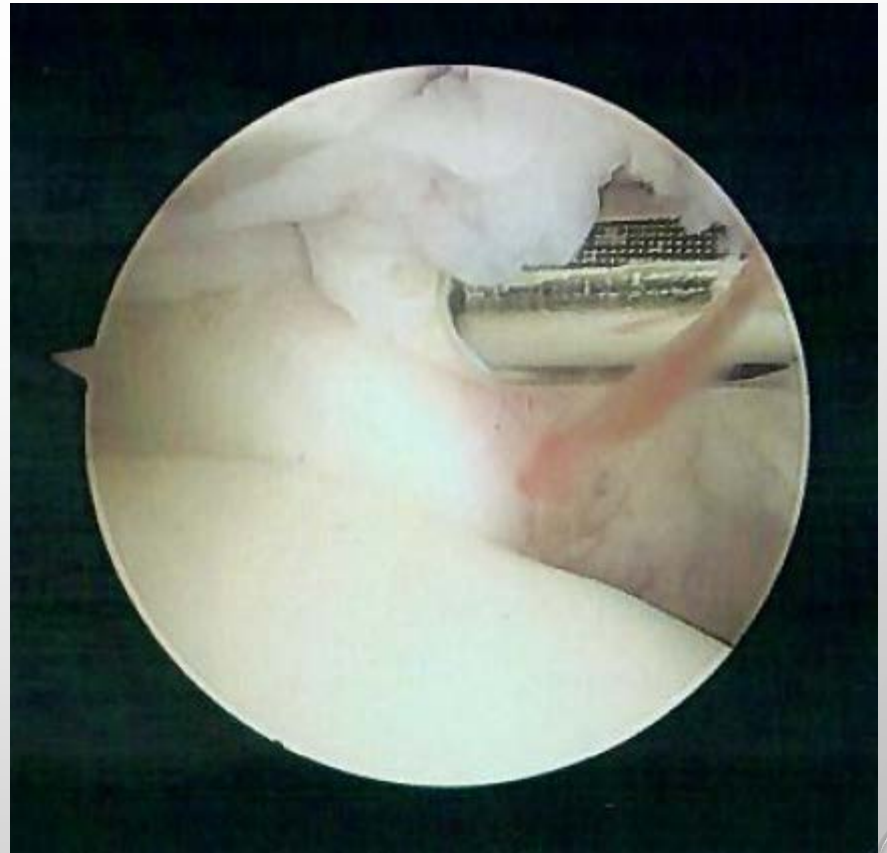
- ANKLE ARTHROSCOPY
- ANKLE ARTHROSCOPY AND TIGHTROPE FIXATION (SUTURE BUTTON)
- SYNDESMOTIC RECONSTRUCTION
 - INTERNAL BRACE
 - ALLOGRAFT
- SYNDESMOTIC ATHRODESIS

FOLLOW-UP

- FIRST CASE – 20F
 - 6 WEEKS PT, LACE UP ANKLE BRACE
 - 8 WEEK VISIT – NO PAIN WITH RUNNING, PLAN FOR ADDITIONAL 1 MONTH OF PT WITH GRADUAL RETURN TO SPORTS
-
- SECOND CASE – 35M
 - FAILED 6 WEEKS PT
 - HAD SURGERY









**SOMETIMES IT IS MORE
OBVIOUS...**

31M GENERAL CONTRACTOR S/P ANKLE INJURY











STANDING

R
RH

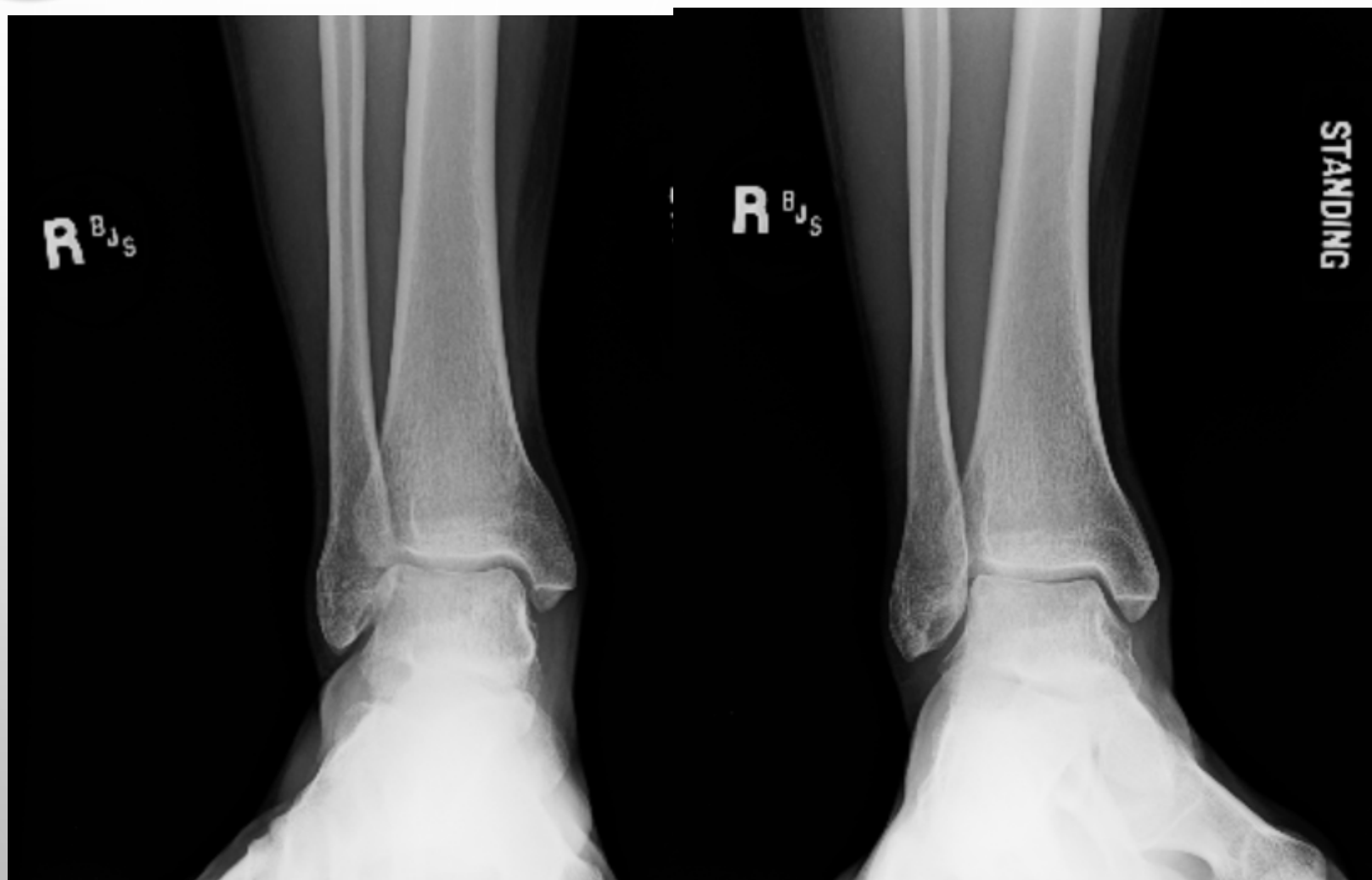


CASE PRESENTATION

- 18M SUSTAINED AN ANKLE SPRAIN 6 MONTHS AGO, SEEN BY AN OUTSIDE PROVIDER
 - BOOT IMMOBILIZATION, THEN PT
 - PERSISTENT PAIN AFTER 6 WEEKS OF PT, CONTINUED FOR 3 MONTHS TOTAL TREATMENT
 - REFERRED FOR A SECOND OPINION

CLINICAL EXAM

- MODERATE ANKLE JOINT EFFUSION
- TENDERNESS DIFFUSELY ALONG THE JOINT LINE
- NO TENDERNESS ALONG THE LATERAL ANKLE LIGAMENTS
- MILD LAXITY TO ANTERIOR DRAWER TESTING
- DISTALLY NVI
- THOUGHTS?

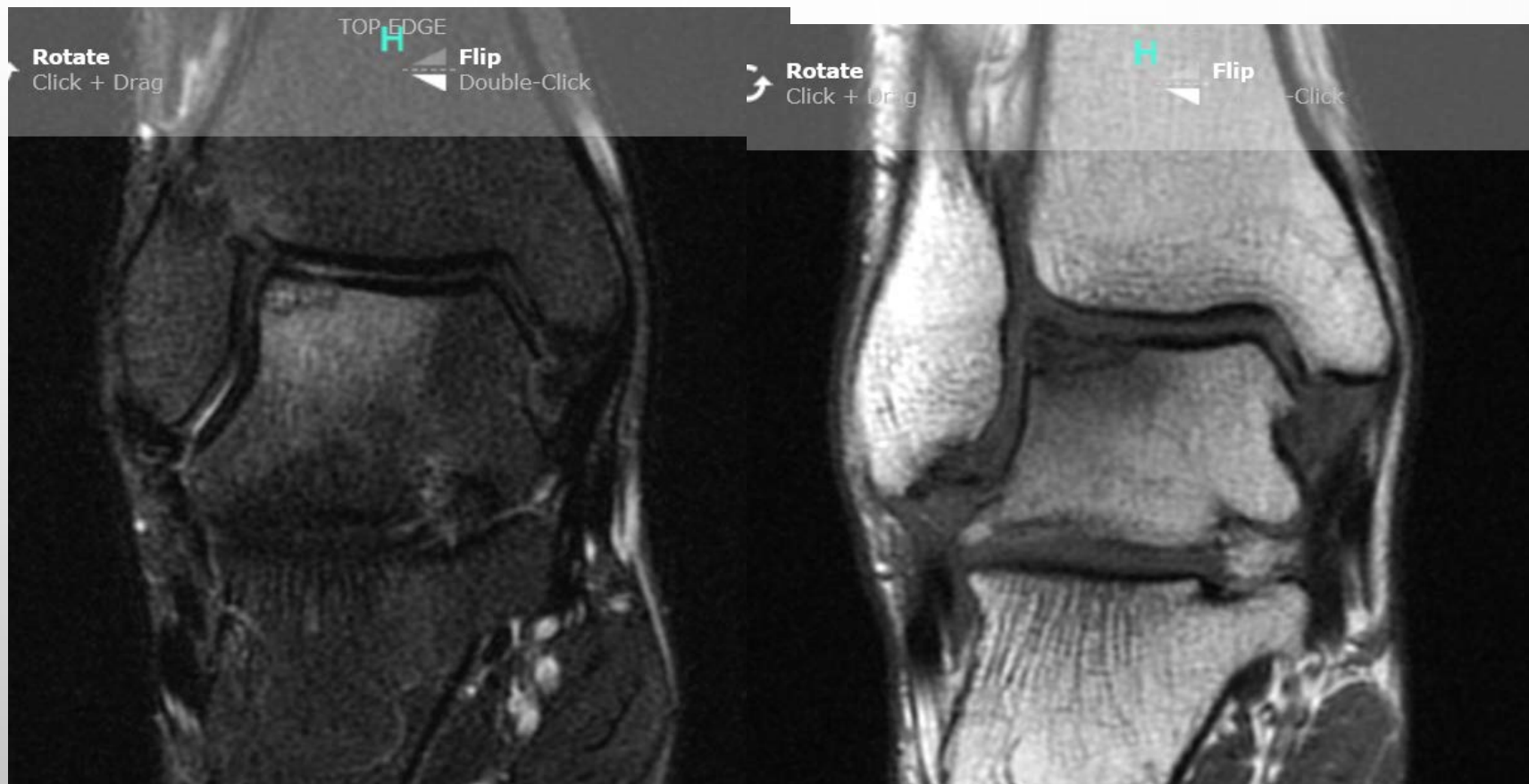


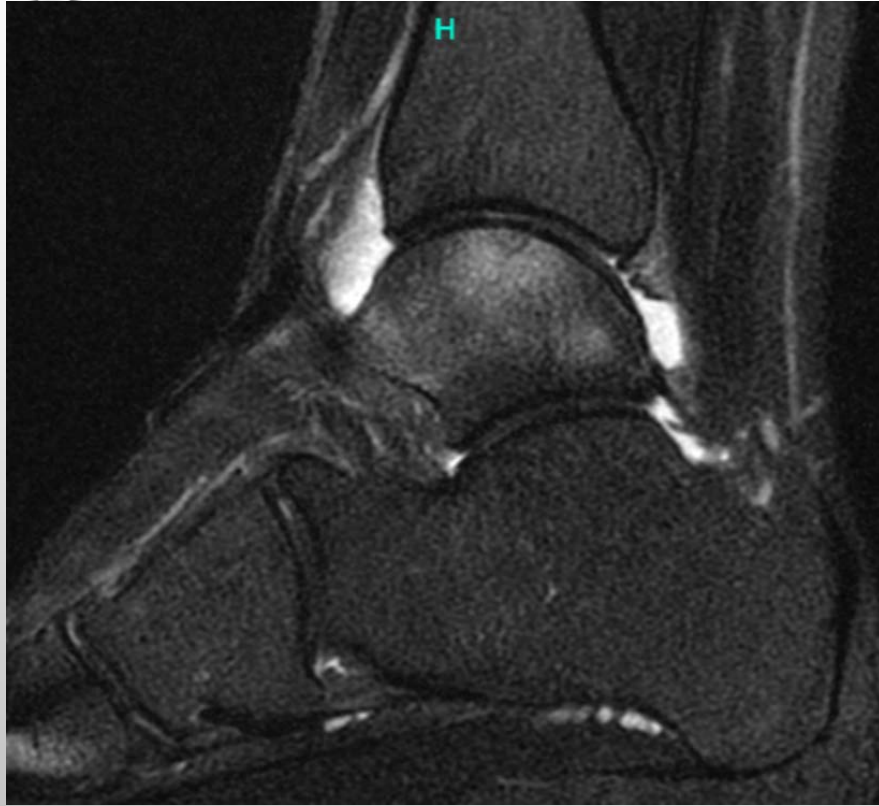




ADVANCED IMAGING

- CT?
- MRI?





OSTEOCHONDRAL LESIONS OF THE TALUS

- DEFECTS IN THE CARTILAGE AND SUBCHONDRAL BONE OF THE TALUS
 - MEDIAL – MORE COMMON
 - LATERAL – USUALLY TRAUMATIC
- OFTEN NOT VISIBLE ON PLAIN FILMS
- CAUSE PERSISTENT ANKLE JOINT PAIN AND EFFUSION AFTER AN ANKLE SPRAIN
- CAN CAUSE CATCHING, LOCKING, MECHANICAL SYMPTOMS

OLTS - IMAGING

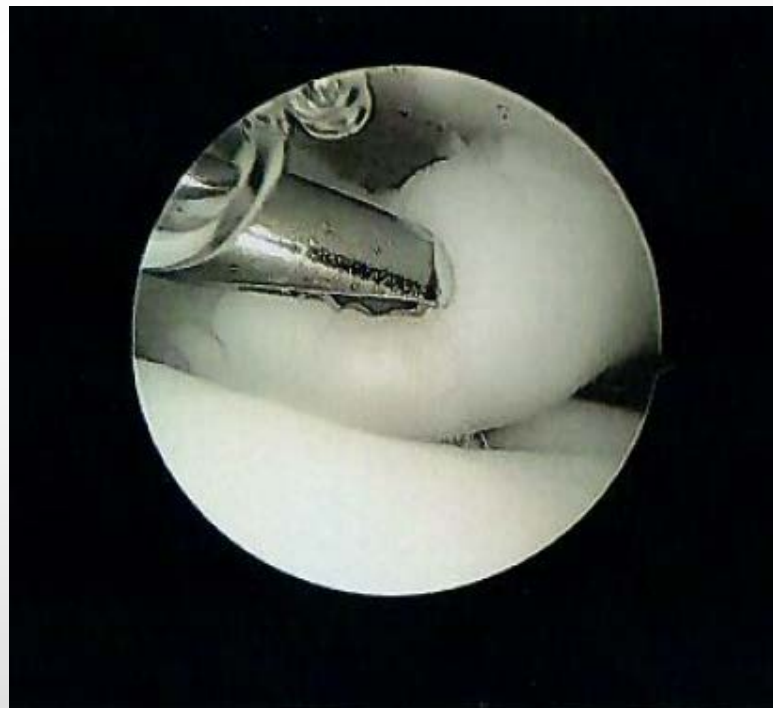
- PLAIN RADIOGRAPHS – MAY NOT BE VISIBLE
- MRI – STANDARD OF CARE FOR DIAGNOSIS IF SUSPICION HIGH
 - 3T WITHOUT CONTRAST
- CT
 - USEFUL IN EVALUATION OF DISPLACEMENT, SIZE OF FRAGMENT, AND FOR PRE-OPERATIVE PLANNING

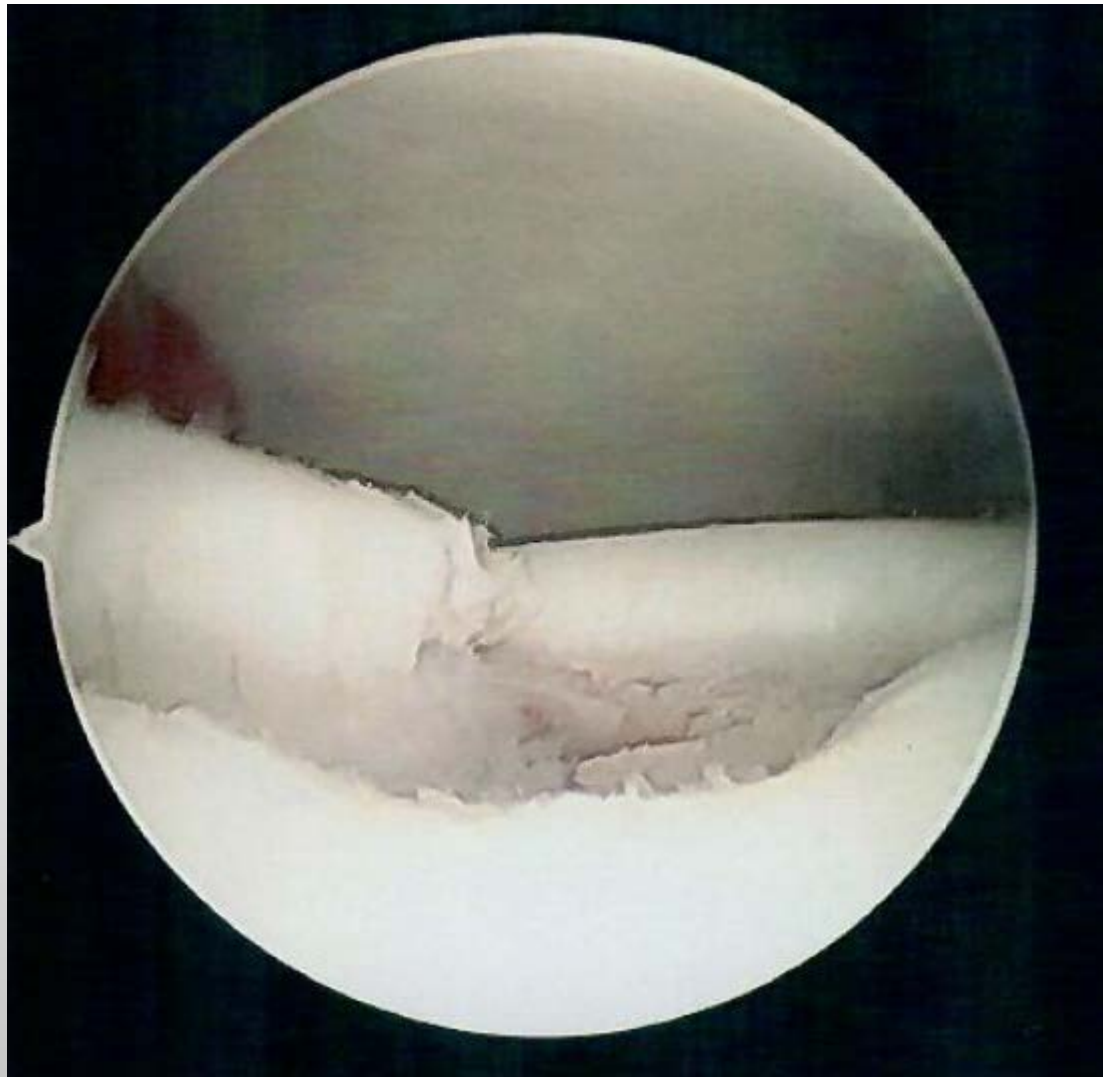
OLTS - TREATMENT

- ACUTE – NWB X 6 WEEKS IN BOOT OR CAST
 - NON-DISPLACED FRAGMENTS AND INCOMPLETE FRACTURES
 - NO FLUID SIGNAL UNDERNEATH THE FRAGMENT ON MRI
- ACUTE DISPLACED – ARTHROSCOPY WITH REMOVAL OF LOOSE BODIES AND MICROFRACTURE SUBACUTE (PERFORM WITH BROSTRUM IF INSTABILITY)
 - DENOVO
 - OATS
 - ALLOGRAFT HEMI TALUS
- CHRONIC – CORTICOSTEROID INJECTION, BRACING, NSAIDS, ETC
 - ANKLE ARTHRODESIS/REPLACEMENT

FOLLOW-UP

- FAILED CONSERVATIVE TREATMENT
 - REST, IMMOBILIZATION
 - ROLE OF CORTISONE?
 - ROLE OF PT?
- UNDERWENT ANKLE ARTHROSCOPY, MICROFRACTURE OLT
- 5 MONTH FOLLOW-UP
 - RELATIVELY PAIN FREE, BRACE FREE, BACK TO WORK AND RETURNING TO SPORTS





Debridement, Curettage, and Bone Marrow Stimulation: Proceedings of the International Consensus Meeting on Cartilage Repair of the Ankle.

Hannon CP¹, Bayer S², Murawski CD², Canata GL³, Clanton TO⁴, Haverkamp D⁵, Lee JW⁶, O'Malley MJ⁷, Yinghui H⁸, Stone JW⁹; International Consensus Group on Cartilage Repair of the Ankle.

 **Collaborators (84)**

Question: In what cases/lesion types can bone marrow stimulation be considered for the surgical treatment of cartilage pathology of the ankle?

Answer: Bone marrow stimulation can be considered for the surgical treatment of full-thickness chondral or osteochondral lesions that have failed conservative treatment.

Vote: Agree: 93%; Disagree: 7% (Strong Consensus)

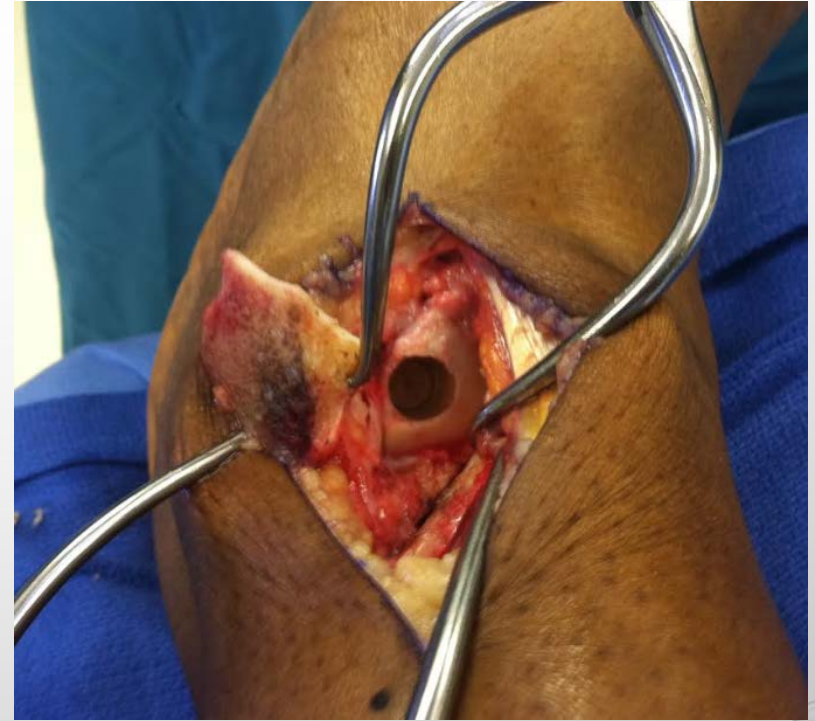
Grade of Evidence: B1

Question: What are the ideal lesion size guidelines (diameter, depth, etc) for the use of bone marrow stimulation in the primary surgical treatment of an osteochondral lesion of the talus?

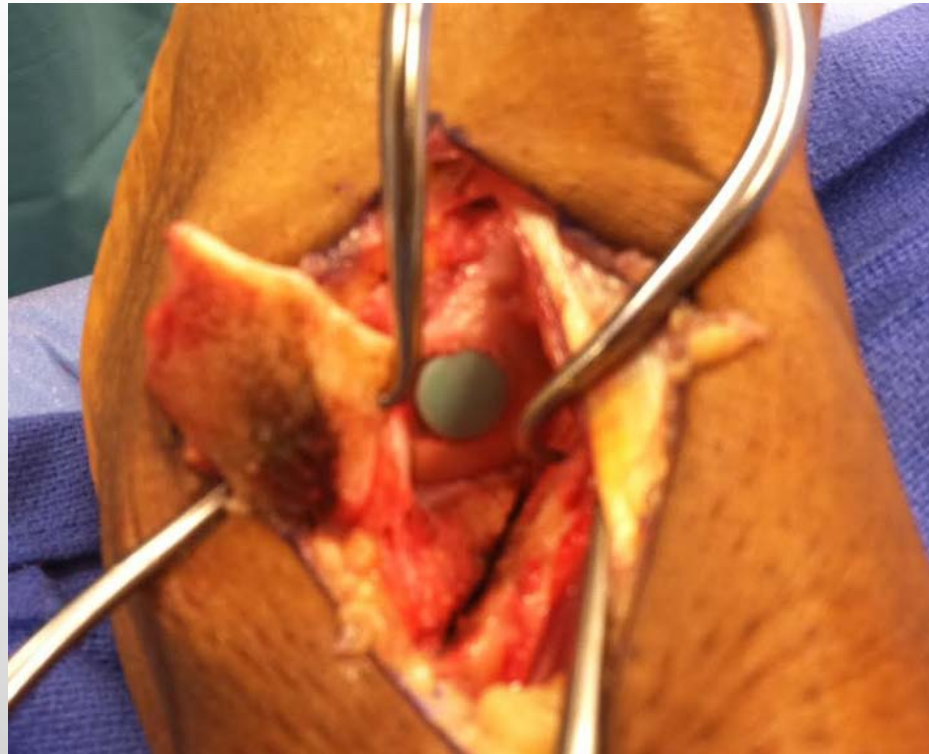
Answer: The ideal size guidelines for use of bone marrow stimulation are lesions <10 mm in diameter, <100 mm² in area, and <5 mm in depth. Bone marrow stimulation is less likely to succeed when used as a sole treatment in a lesion 15 mm in diameter or greater.

Vote: Agree: 94%; Disagree: 6% (Strong Consensus)

Grade of Evidence: Diameter, A1; Area, A1; Depth, B2



*courtesy of Greg Guyton, MD



*courtesy of Greg Guyton, MD

CASE PRESENTATION

- 47M TWISTED HIS ANKLE ON ICE WHILE RUNNING
 - ON DUTY POLICE OFFICER, ACTIVE IN MANY SPORTS
 - SEEN AT URGENT CARE, XRAY NEGATIVE
 - PLACED IN AN AIRCAST, TOLD TO FOLLOW-UP
 - TRIED TO COME OUT OF THE AIRCAST, BUT HAD PERSISTENT PAIN WITH WEIGHT BEARING
 - PRESENTED BECAUSE HE COULDN'T RETURN TO WORK OR ANY TYPE OF SPORTS/RUNNING

CLINICAL EXAM

- NEUTRAL HINDFOOT ALIGNMENT
- ANTEROLATERAL ANKLE TENDERNESS JUST PROXIMAL TO THE JOINT
- LATERAL ANKLE LIGAMENT TENDERNESS
- MILD JOINT EFFUSION AND TENDERNESS ALONG THE MEDIAL JOINT LINE
- MOST PAIN IS LATERAL ANKLE BEHIND THE FIBULA AND JUST DISTAL TO THE FIBULA
- THOUGHTS?

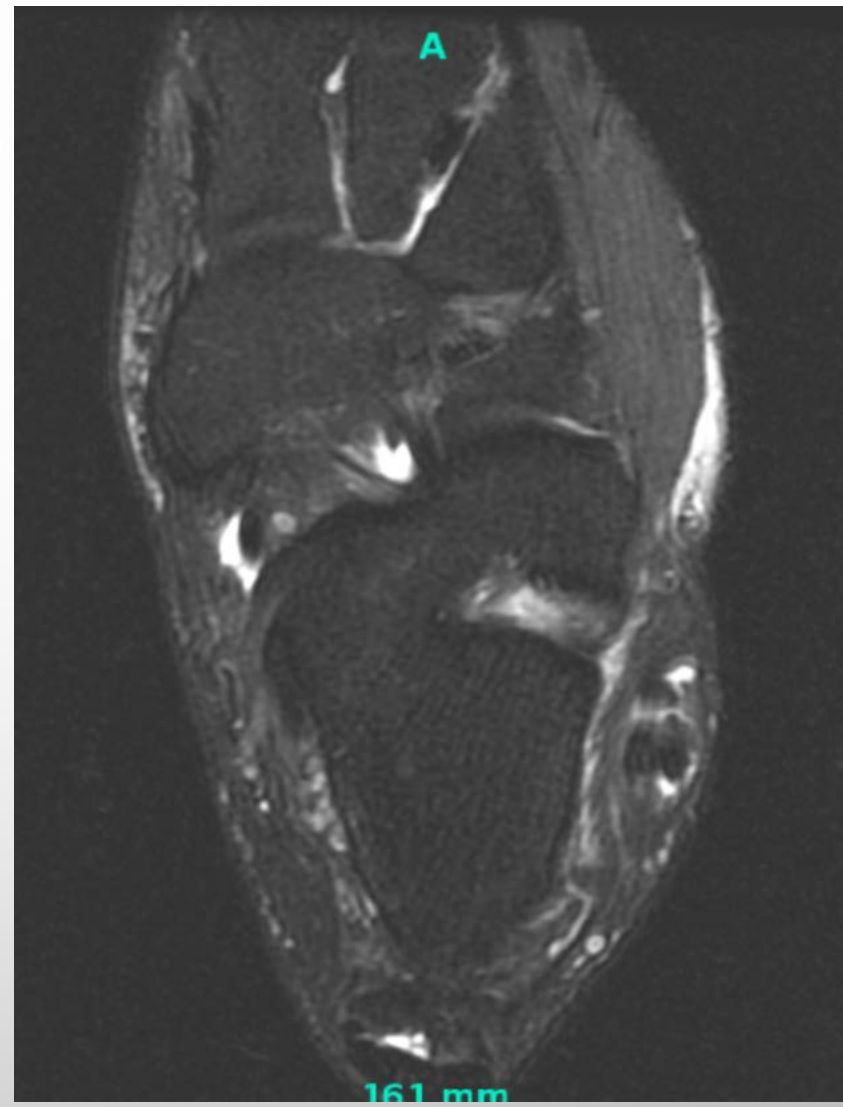
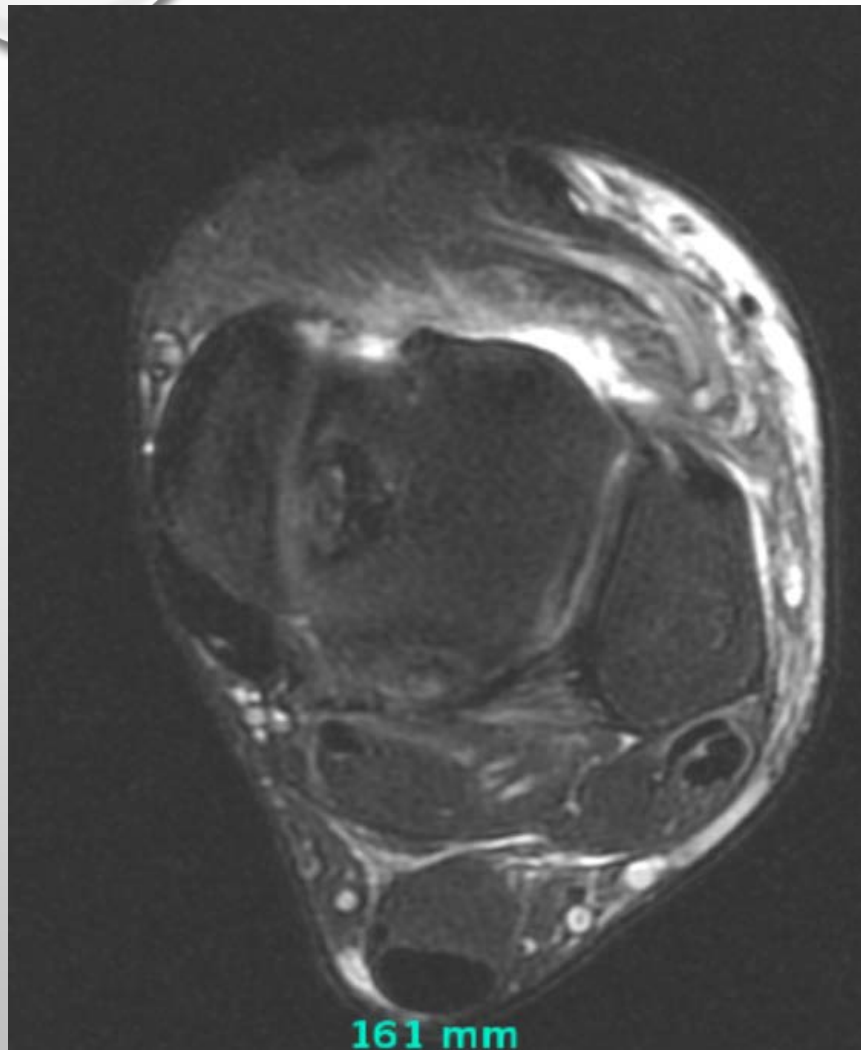


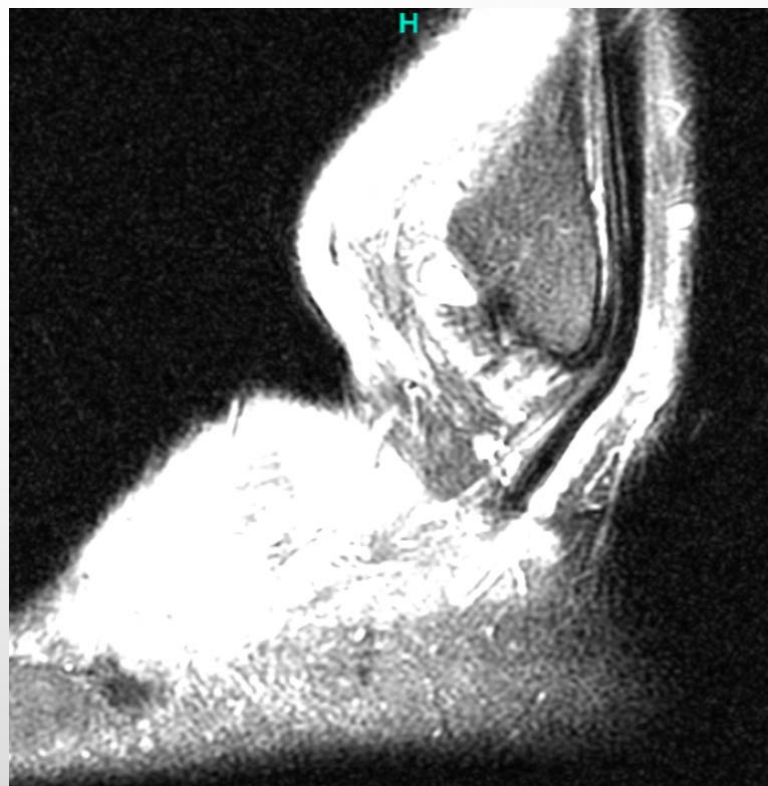
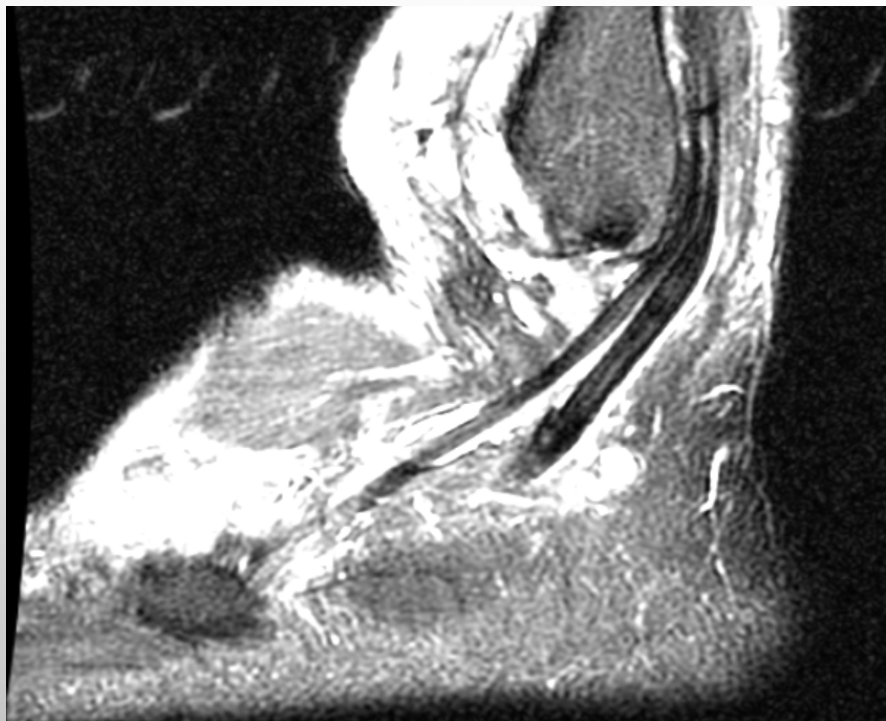




ADVANCED IMAGING

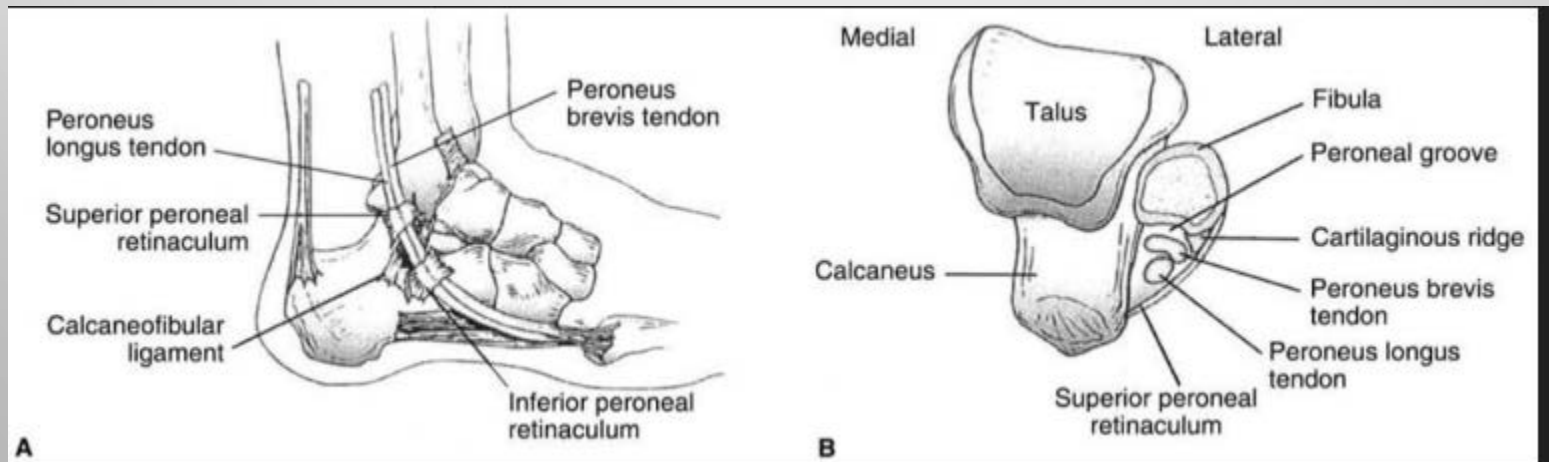
- CT?
- MRI?





PERONEAL TENDON PATHOLOGY

- PERONEUS BREVIS & PERONEUS LONGUS
- LATERAL LEG COMPARTMENT MUSCULATURE THAT PASS BEHIND THE FIBULA AND ATTACH TO THE FIFTH METATARSAL BASE AND THE FIRST METATARSAL BASE
- COVERED BY THE SPR



DIAGNOSIS

- CLINICAL EXAM – POPPING OR CLICKING AROUND THE LATERAL ANKLE
 - LATERAL ANKLE PAIN AND SWELLING POSTERIOR TO THE LATERAL MALLEOLUS
 - PAIN WITH RESISTED ANKLE EVERSION
- IMAGING
 - XRAYs – USUALLY NOT HELPFUL UNLESS A FLECK SIGN NOTED
 - MRI – SHOWS TEARS, LOW LYING MUSCLE BELLY

TREATMENT

- NON-OPERATIVE
 - BOOT IMMOBILIZATION
 - PHYSICAL THERAPY X 6 WEEKS
- OPERATIVE
 - COMPLETE TEARS WITH RETRACTION
 - INCOMPLETE TEARS OR LONGITUDINAL TEARS THAT DO NOT RESPOND TO CONSERVATIVE MANAGEMENT
 - DISLOCATED TENDONS
 - SUBLUXATING TENDONS THAT FAIL CONSERVATIVE MANAGEMENT

PERONEAL TENDOSCOPY



FOLLOW-UP

- ASSOCIATED PATHOLOGY – SYNDESMOSIS PARTIAL TEAR, LATERAL ANKLE LIGAMENT TEAR, OLT
- FAILED 6 WEEKS OF PT
- UNDERWENT ANKLE ARTHROSCOPY, MICROFRACTURE OLT, REPAIR BOTH PERONEUS BREVIS AND LONGUS TEARS, SYNDESMOSIS FIXATION WITH TIGHTROPE, BROSTRUM
- 4 WEEKS POST-OP (6 WEEKS NWB IN SPLINT/CAST/BOOT)

CASE PRESENTATION

- 14F SUSTAINED AN INJURY TO HER RIGHT FOOT AND ANKLE DURING DANCE REHEARSAL FOR A SCHOOL PLAY
 - ABLE TO WEIGHT BEARING INITIALLY
 - PERSISTENT PAIN WITH WALKING, COULD NOT RETURN TO DANCE
 - PRESENTED 10 DAYS AFTER THE INJURY
 - THOUGHTS?

CLINICAL EXAM

- MILD CAVOVARUS FOOT ALIGNMENT
- TENDERNESS OVER THE LATERAL ANKLE LIGAMENTS
- NO BRUISING ON THE ANKLE OR FOOT
- MILD TENDERNESS OVER THE MIDFOOT
- OTHERWISE NVI

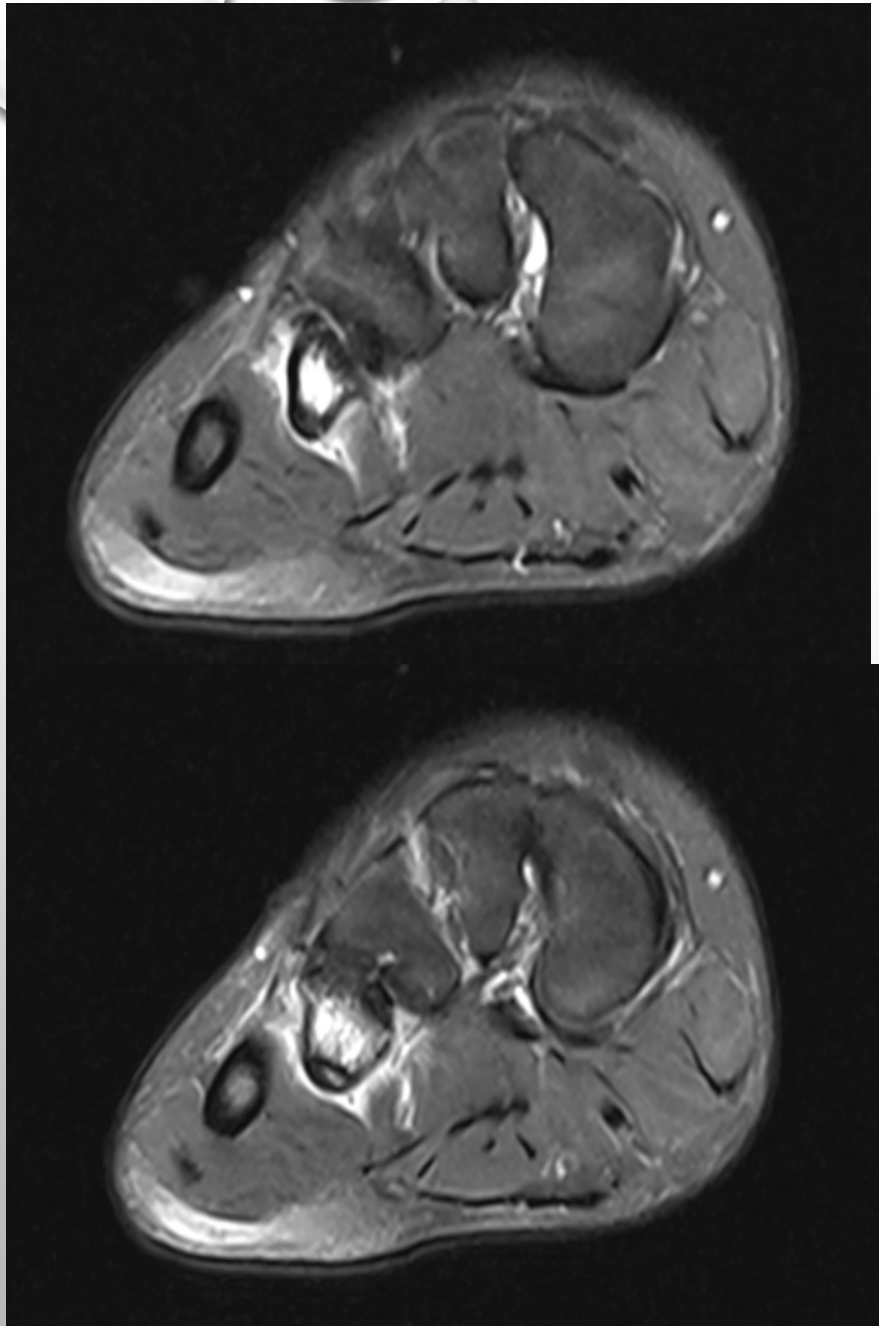






ADVANCED IMAGING???

- CT?
- MRI?



The image features a light gray background with a subtle gradient. In the top-left and bottom-right corners, there are several realistic-looking water droplets of various sizes. These droplets have highlights and shadows, giving them a three-dimensional appearance. The text "CAST OR SURGERY?" is centered in the upper half of the image.

CAST OR SURGERY?

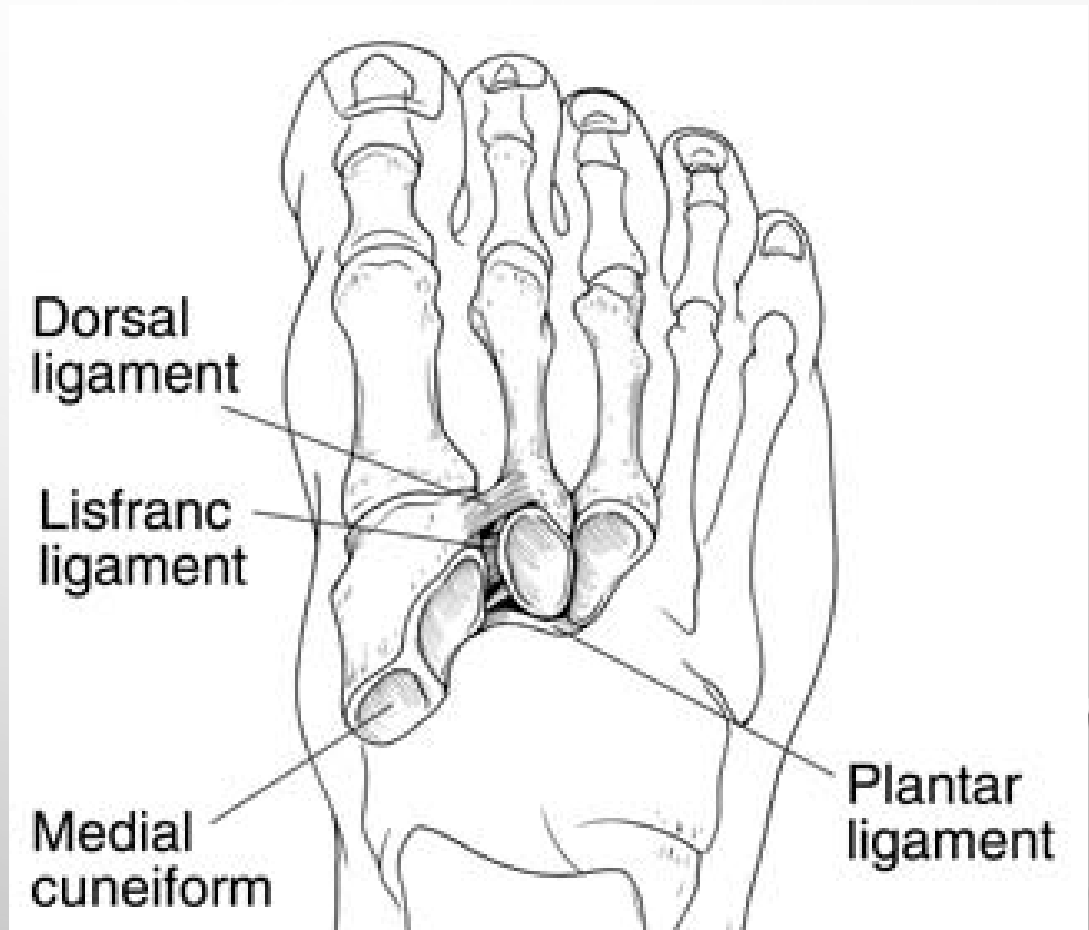






ANATOMY

- LISFRANC LIGAMENT COMPLEX
 - DORSAL
 - INTEROSSEUS
 - PLANTAR
- BETWEEN THE MEDIAL CUNEIFORM AND SECOND METATARSAL BASE



STATISTICS

- 20% OF THE INJURIES ARE MIS-DIAGNOSED OR MISSED
- 1/3 OCCUR DUE TO A LOW ENERGY MECHANISM
- 4% OF AMERICAN FOOTBALL PLAYERS SUSTAIN THIS INJURY
 - SEASON ENDING

CLINICAL EXAM



- PAIN OVER TARSMETATARSAL ARTICULATION (MIDFOOT)
- PLANTAR ECCHYMOSIS
- PAIN WITH WEIGHT-BEARING
- OBVIOUS DEFORMITY

LISFRANC - DIAGNOSIS

- WEIGHT-BEARING PLAIN FILMS
- CONTRALATERAL WEIGHT BEARING FILMS
- CT – TO ESTABLISH DISPLACEMENT, EVAL FRACTURE PATTERNS, PRE-OP PLANNING
- MRI – PURELY LIGAMENTOUS INJURIES

TREATMENT

- NON-OPERATIVE – CAST/NWB FOR 8 WEEKS
 - NO DISPLACEMENT ON STRESS/WB VIEWS
- OPERATIVE – ANY INSTABILITY (2MM)
 - ORIF
 - ARTHRODESIS
 - *SOME LEVEL I EVIDENCE THAT PRIMARY LIGAMENTOUS INJURIES DO BETTER WITH ARTHRODESIS

Open Reduction and Internal Fixation Versus Primary Arthrodesis for the Treatment of Acute Lisfranc Injuries: A Systematic Review and Meta-analysis.

Magill HHP¹, Hajibandeh S², Bennett J³, Campbell N³, Mehta J⁴.

This study aims to compare outcomes of open reduction and internal fixation (ORIF) and primary arthrodesis in management of Lisfranc injuries. In accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement standards, a systematic review was carried out. MEDLINE, EMBASE, CINAHL, and the Cochrane Central Register of Controlled Trials were searched to identify both randomised controlled trials (RCTs) and nonrandomised studies comparing the outcomes of ORIF and primary arthrodesis for Lisfranc injuries. Random- and fixed-effect statistical models were applied to calculate the pooled outcome data. Two RCTs and 3 observational studies were identified, compiling a total of 187 subjects with acute Lisfranc injuries and a mean follow-up duration of 62.3 months. Our results demonstrate that ORIF is associated with a significantly higher need for revision surgery (odds ratio [OR] 6.37, 95% confidence interval [CI] 2.68 to 15.11, $p < .0001$) and a significantly higher rate of persistent pain (OR 6.29, 95% CI 1.07 to 36.89, $p = .04$) compared with primary arthrodesis. However, we found no significant difference between the groups in terms of visual analogue scale pain score, American Orthopaedic Foot & Ankle Society functional score, or rates of infection. Separate analysis of RCTs showed that ORIF was associated with a more frequent need for revision surgery (OR 17.56, 95% CI 5.47 to 56.38, $p < .00001$), higher visual analogue scale pain score (mean difference 2.90, 95% CI 2.84 to 2.96, $p < .00001$), and lower American Orthopaedic Foot & Ankle Society score (mean difference -29.80, 95% CI -39.82 to -19.78, $p < .00001$). The results of the current study suggest that primary arthrodesis may be associated with better pain and functional outcomes and lower need for revision surgery compared with ORIF. The available evidence is limited and is not adequately robust to make explicit conclusions. The current literature requires high-quality and adequately powered RCTs.

- **SUGGESTS THAT PRIMARY ARTHRODESIS MAY BE ASSOCIATED WITH BETTER PAIN AND FUNCTIONAL OUTCOMES AND LOWER NEED FOR REVISION SURGERY**

KEY POINTS

- REMEMBER, A CT OR MRI IS IT **NOT** A DYNAMIC STUDY
- WEIGHT BEARING FILMS MORE USEFUL FOR TREATMENT DECISIONS
- CAN GET WB CT IN CERTAIN LOCATIONS
- MRI WITH EDEMA IN LIGAMENT?

RECAP – THINGS NOT TO MISS

- SYNDESMOTIC INJURY (HIGH ANKLE SPRAIN)
- OLT
- PERONEAL TENDON PATHOLOGY
- ANTERIOR PROCESS FRACTURES
- POSTERIOR MALLEOLUS FRACTURES
- LATEARL PROCESS TALUS FRACTURES
- LISFRANC INJURY
- COALITION
- NAVICULAR STRESS FRACTURE

KEY POINTS

- HAVE A HIGH SUSPICION FOR ASSOCIATED INJURIES WITH ANY ANKLE SPRAIN
- SEE THE PATIENT BACK FREQUENTLY AND FOR A BETTER EXAM ONCE SWELLING IS DECREASED
- WHEN IN DOUBT, OBTAIN REPEAT WB FILMS AND CONSIDER OBTAIN CONTRALATERAL FILMS
- WHEN IN FURTHER DOUBT, OBTAIN ADVANCED IMAGING (BUT EVERY ANKLE SPRAIN DOES NOT NEED AN MRI)
 - GET EARLY IF YOU HAVE HIGH SUSPICION FOR ASSOCIATED INJURY
 - SPRAINS NOT GETTING BETTER AFTER 6 WEEKS SHOULD GET AN MRI
- EARLY REFERRAL TO SUB-SPECIALISTS
- BOOT MAKES EVERYTHING BETTER

REFERENCES

- SELECT REFERENCES AT THE END OF EACH CASE PRESENTATION
- MANN'S SURGERY OF THE FOOT AND ANKLE, 9TH EDITION
- MINIMALLY INVASIVE FOOT & ANKLE SURGERY – BLUMAN/CHIODO
- FOOT & ANKLE SURGERY – OPERATIVE TECHNIQUES – PFEFFER ET AL
- WWW.ORTHOBULLETS.COM

THANK YOU!



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