



*A WHIRLWIND TOUR OF MODERN
ORTHOPEDIC TRAUMA - MIAMI STYLE:*

**'THE ANKLE SYNDESMOSIS:
HOW TO GET IT WRONG
LESS'**

CHRIS HODGKINS, MD

Miami Orthopedics and Sports Medicine Institute

PAOS

San Antonio, Texas

August 30th, 2019

SDS AGENDA

WHAT IS IT

**WHY IS IT
IMPORTANT**

**HOW TO
DIAGNOSE**

THE ANKLE SYNDESMOSIS

IMAGING OPTIONS

**HOW TO REDUCE
IT**

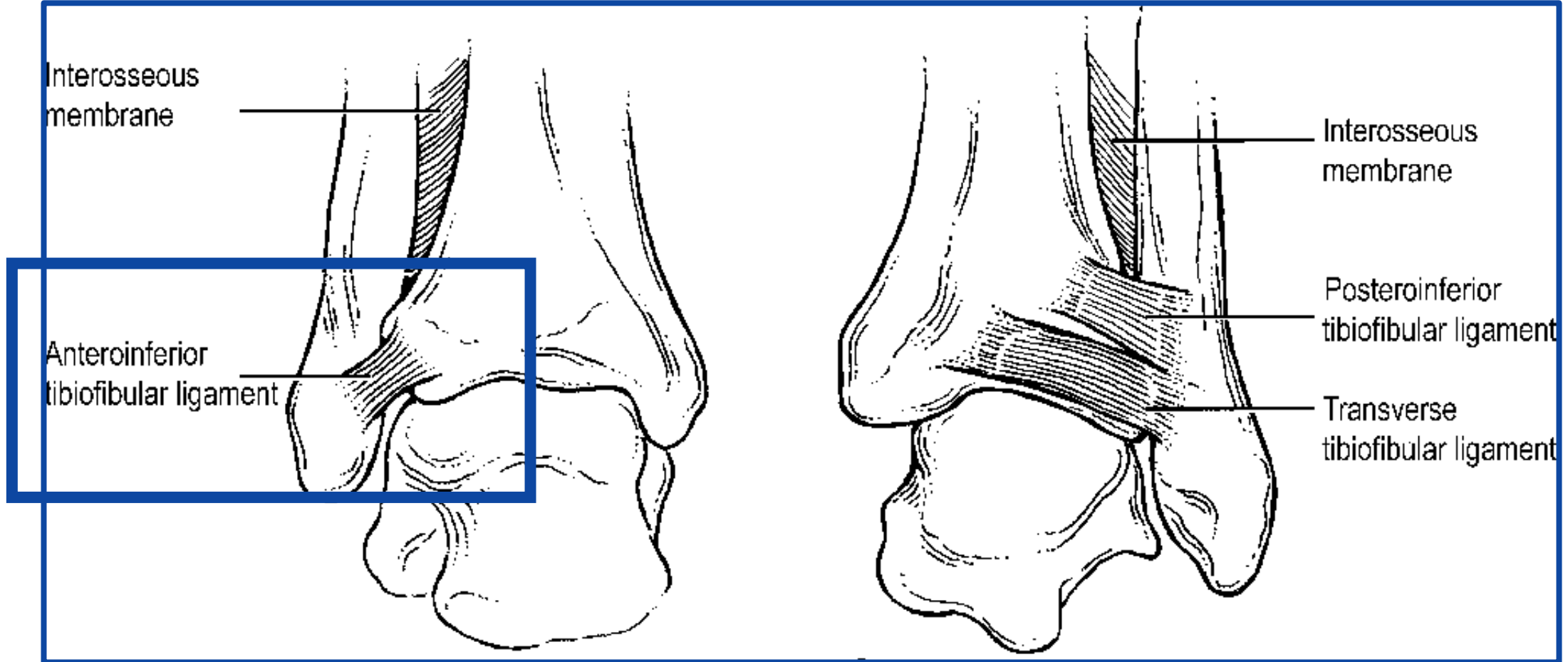
HOW TO FIX IT

WHAT IS IT?

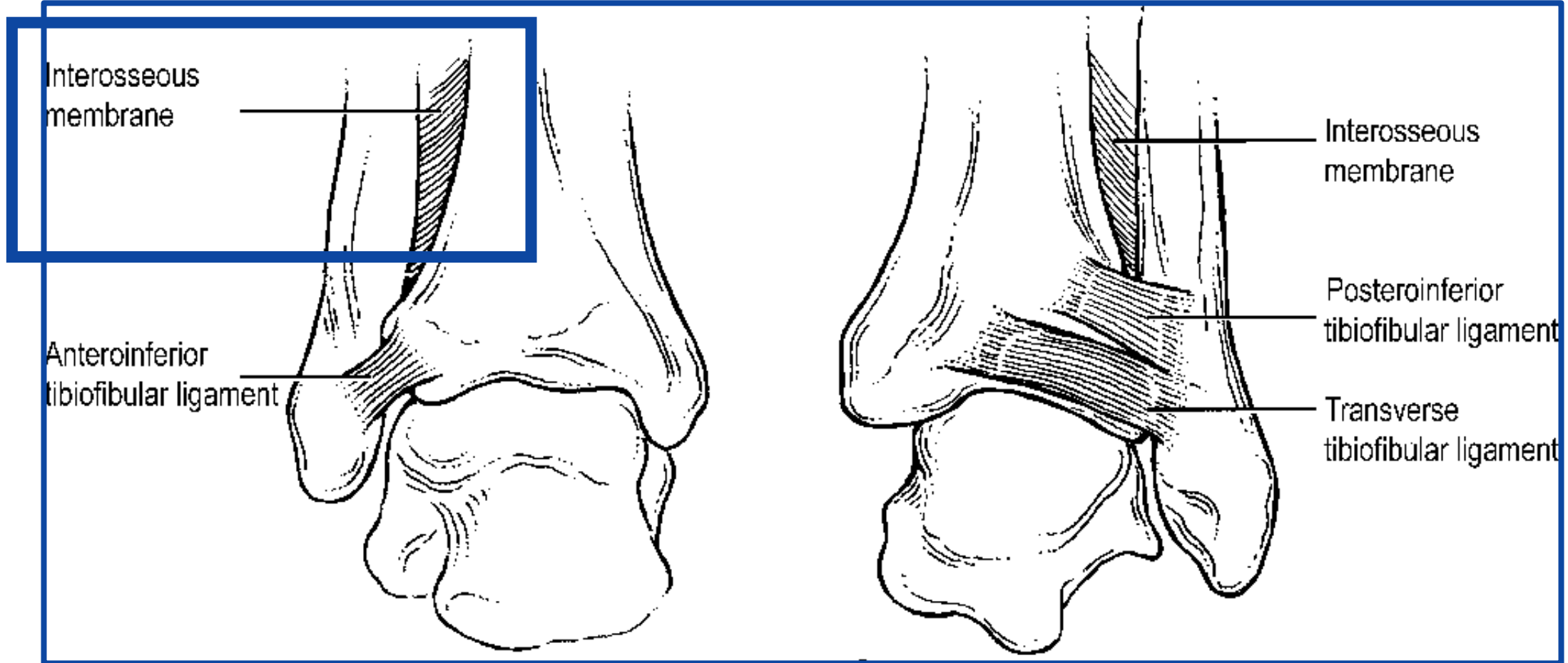
3 DIMENSIONAL RELATION SHIP OF THE DISTAL TIBIA AND FIBULA



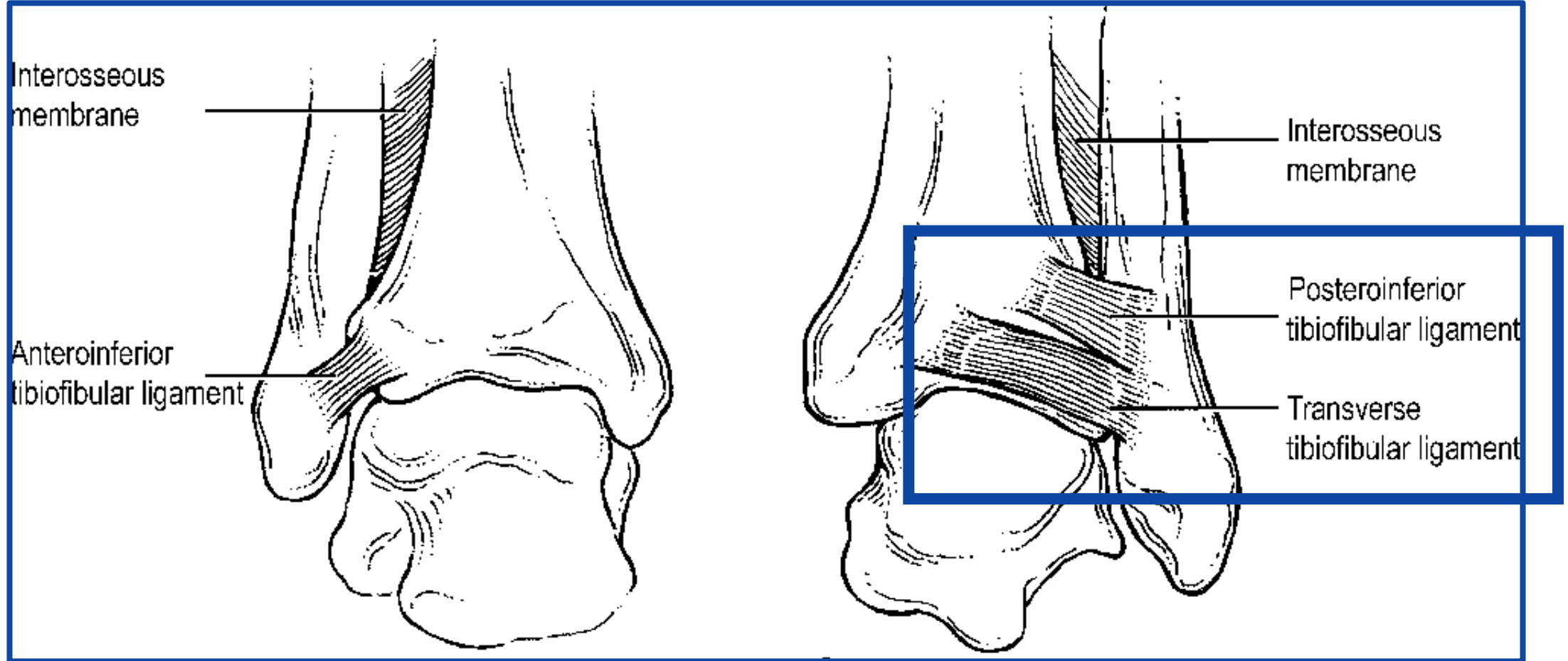
ANATOMY: AITFL



ANATOMY: IOM



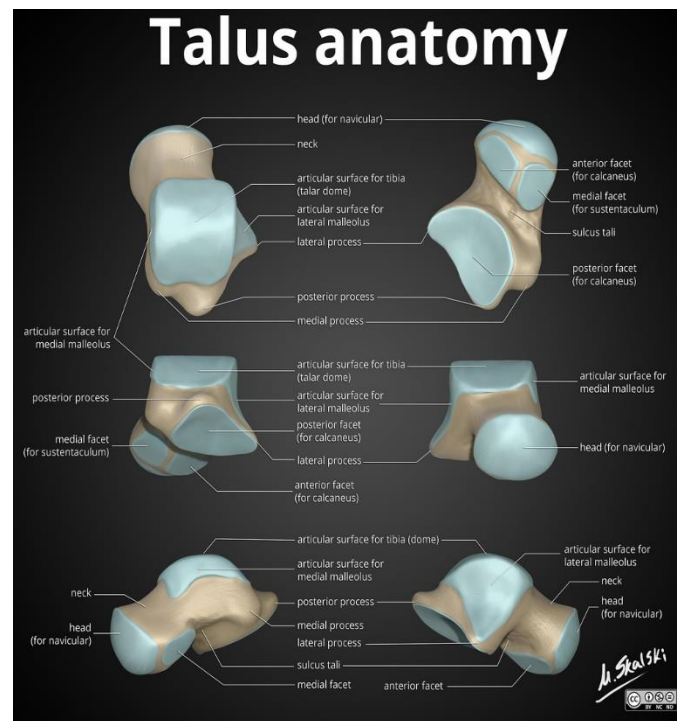
ANATOMY: PITFL/TL



WHAT DOES IT DO?

SYNDESMOSIS FUNCTION:

**CONTROLS
THE POSITION
OF THE TALUS
WITHIN THE
MORTISE**



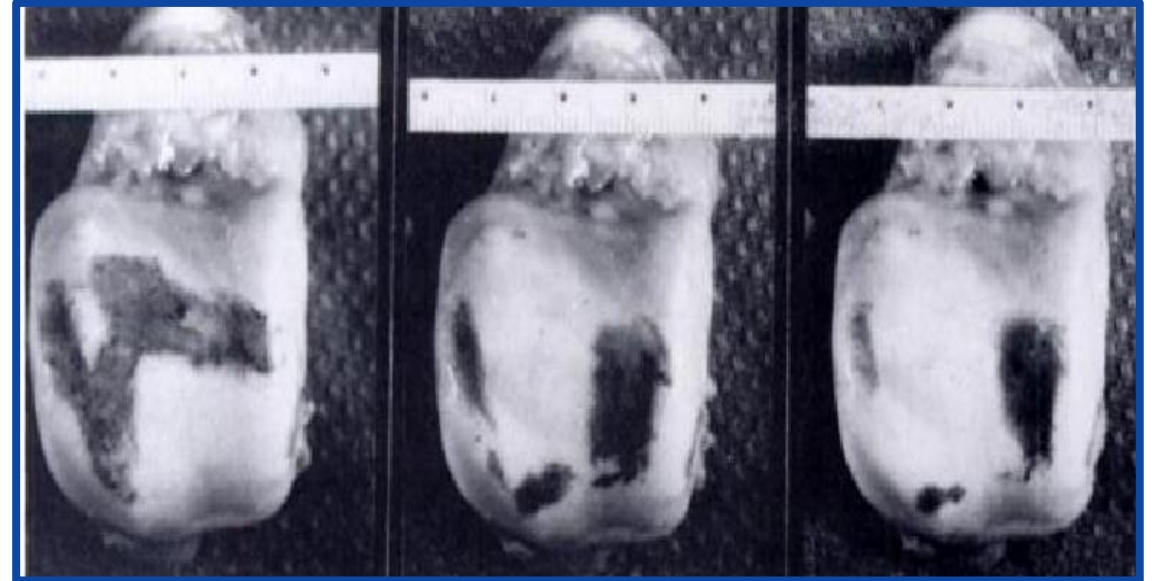
**MAINTAINS
THE
CONGRUITY
OF THE ANKLE
JOINT**

SYNDESMOSIS IMPORTANCE:

Changes in Tibiotalar Area of Contact Caused by Lateral Talar Shift

BY PAUL L. RAMSEY, M.D.* AND WILLIAM HAMILTON, M.D.†, WILMINGTON, DELAWARE

From the Alfred I. duPont Institute, Wilmington



**1MM OF TALAR SHIFT =
42% DECREASE IN CONTACT AREA!**

SYNDESMOSIS IMPORTANCE:



**MALREDUCTIONS &
INSTABILITY**

=

**BIG
PROBLEM!**

SYNDESMOSIS IMPORTANCE:

LIMITED SALVAGE OPTIONS



**OK, SO REDUCE
IT, AND LET'S
MOVE ON?**

**WELL, EASIER
SAID THAN
DONE...**

NOT SO EASY...

The Functional Consequence of Syndesmotic Joint Malreduction at a Minimum 2-Year Follow-Up

H. Claude Sagi, MD, Anjan R. Shah, MD, and Roy W. Sanders, MD



The Functional Consequence of Syndesmotic Joint Malreduction at a Minimum 2-Year Follow-Up

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FELLOWSHIP TRAINED TRAUMA SURGEONS

40% MALREDUCTION RATE (CT)

POOR OUTCOMES AT 2 YEARS

FACTS:

SDS MALREDUCTION IS A BIG PROBLEM

IT'S MORE DIFFICULT THAN MOST THINK

EVEN THE BEST ARE GETTING IT WRONG



'THE ANKLE SYNDESMOSIS: HOW TO GET IT WRONG LESS'

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DISCLAIMERS

VAST GRAND
ROUNDS
TOPIC

HIT THE HIGH
YIELD AREAS

SDS HIGH YIELD AREAS:

WHAT IS IT

**WHY IS IT
IMPORTANT**

**HOW TO
DIAGNOSE**

THE ANKLE SYNDESMOSIS

IMAGING OPTIONS

HOW TO REDUCE IT

HOW TO FIX IT

DIAGNOSIS TIPS

DIAGNOSIS POINTERS:



Maisonneuve
Fracture



**EXAMINE AND
IMAGE ENTIRE LEG!**

**WEIGHT BEARING
ANKLE FILMS**

DIAGNOSIS POINTERS:



POST MALL FX?

**DELTOID
AVULSION?**

**CONTRALATERAL
FILMS**

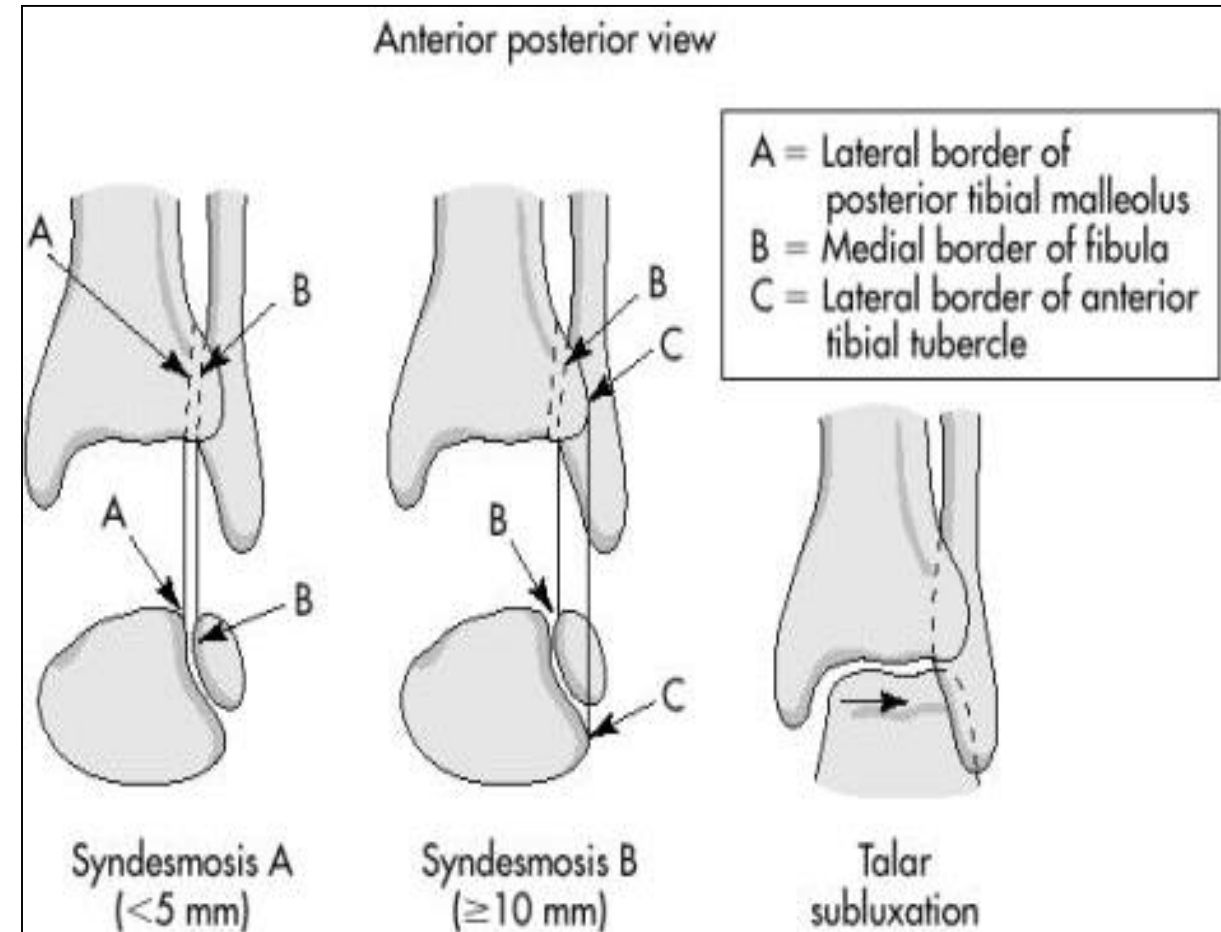
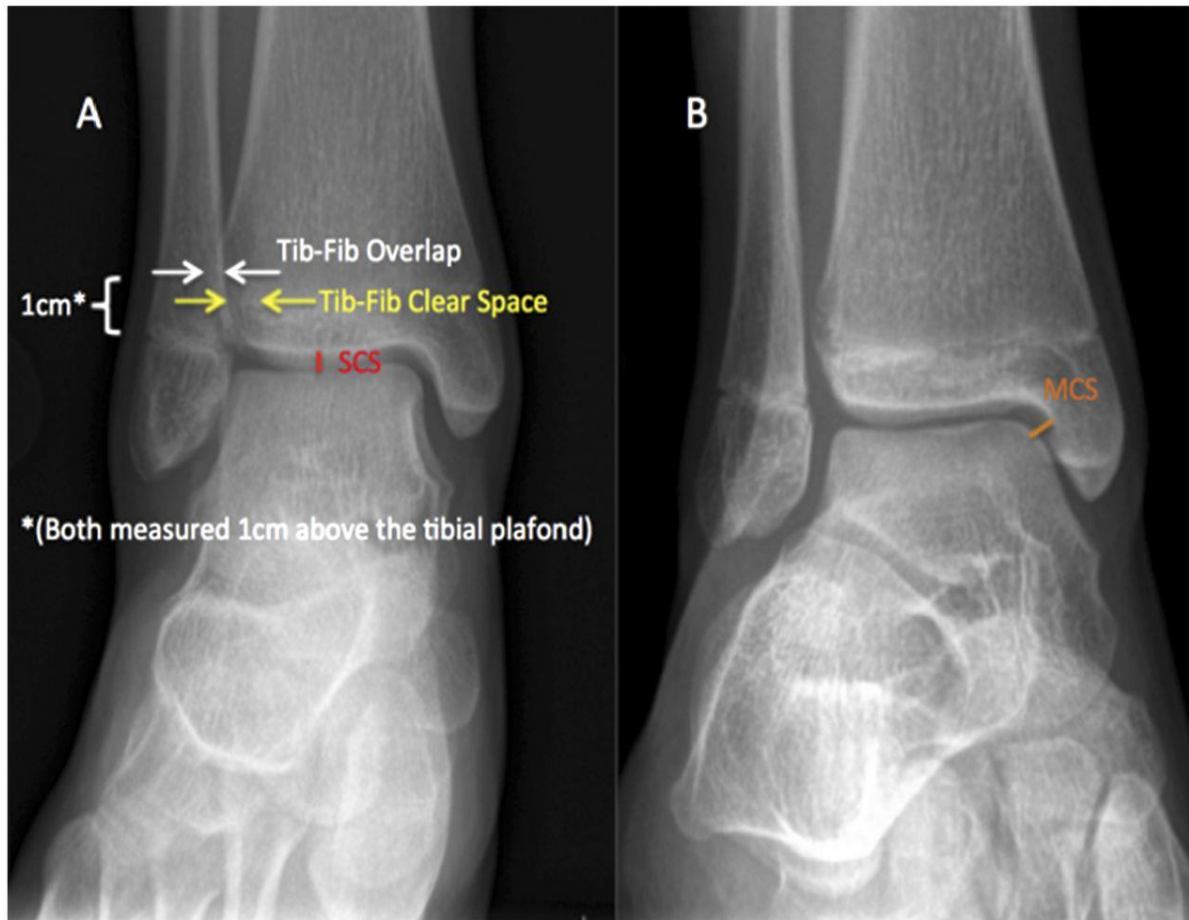
STRESS FILMS

DIAGNOSIS POINTERS:

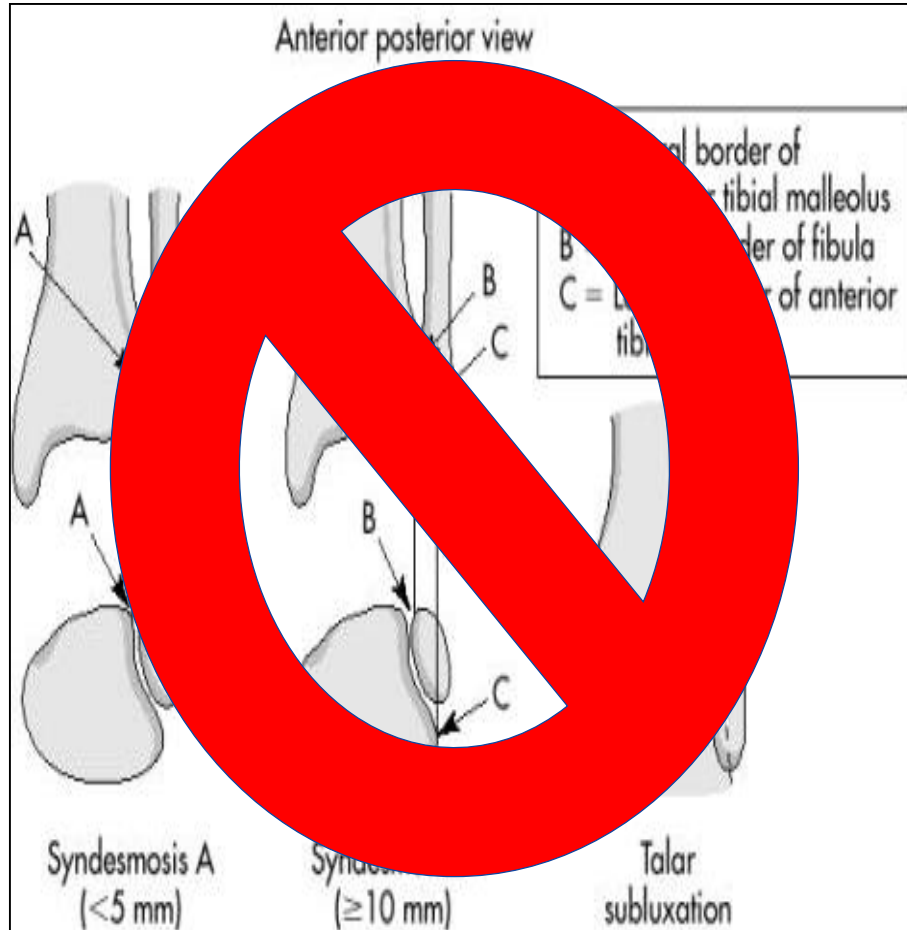


**BILATERAL
WEIGHT
BEARING
CT SCAN**

IMAGING POINTERS:



IMAGING POINTERS:



NOT RELIABLE

**I DO NOT
MEASURE**

DETECTING SDS INSTABILITY INTRA OP:

INTRAOPERATIVE TESTS:



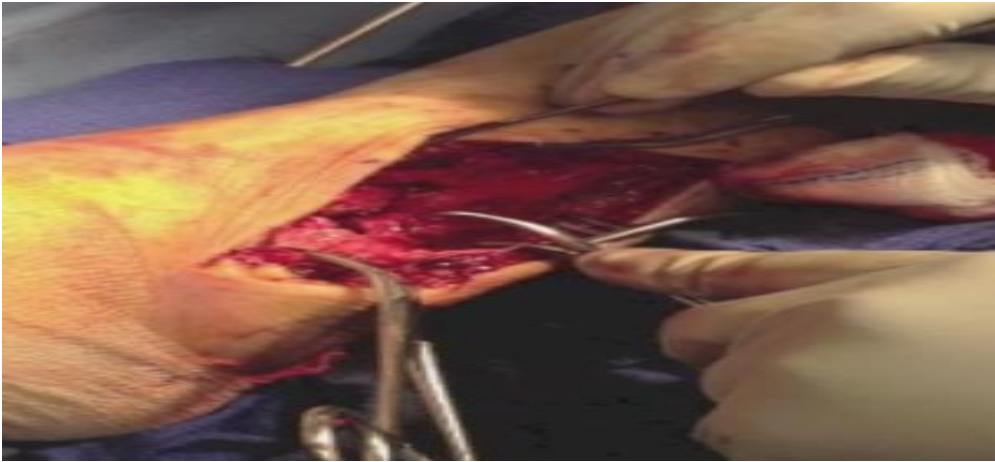
**FLUORO STRESS
VIEW**

INTRAOPERATIVE TESTS:



COTTON TEST

INTRAOPERATIVE TESTS:



GOLD STANDARD:

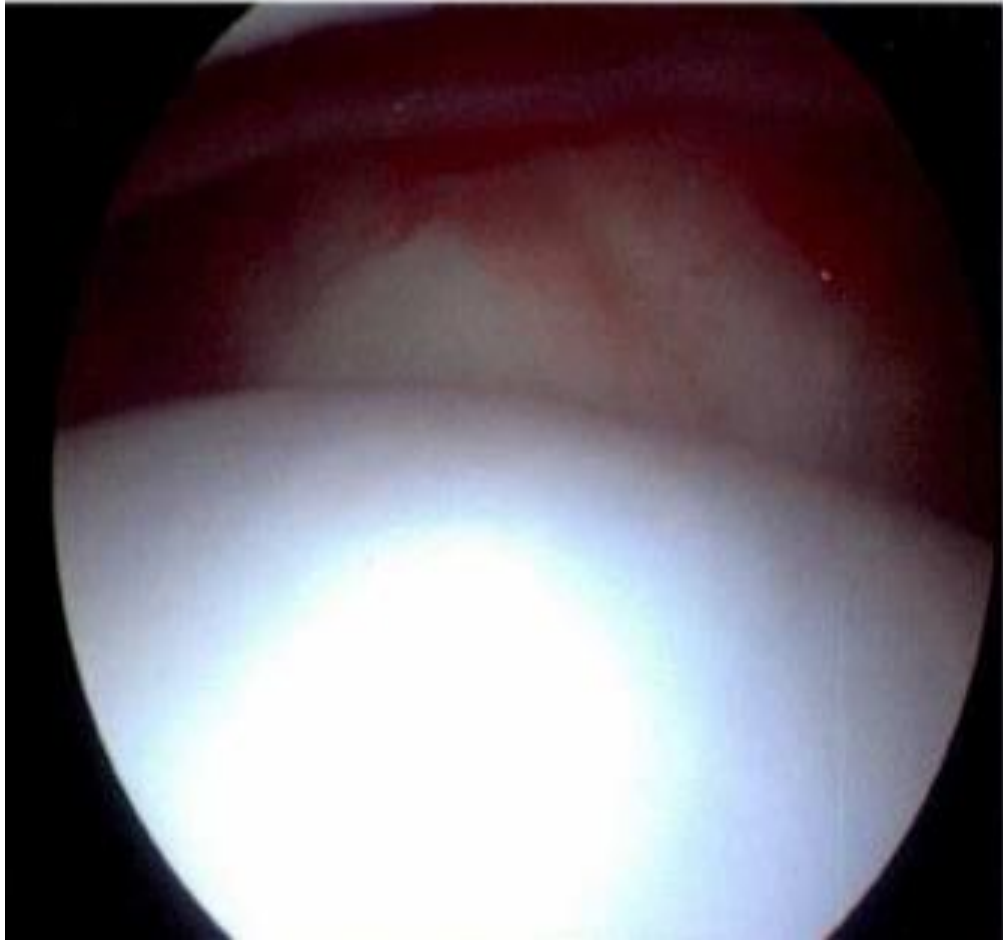
DIRECT VISUALIZATION

- **PUSH/PULL/ROTATE**
- **REDUCE**





INTRAOPERATIVE TESTS:



ARTHROSCOPIC EXAMINATION

SDS HIGH YIELD AREAS:

WHAT IS IT

**WHY IS IT
IMPORTANT**

**HOW TO
DIAGNOSE**

THE ANKLE SYNDESMOSIS

IMAGING OPTIONS

HOW TO REDUCE IT

HOW TO FIX IT

**HISTORICALLY,
ATTENTION
HAS BEEN
MISPLACED:**

MISPLACED ATTENTION:

FIXATION

FIXATION

FIXATION

MISPLACED ATTENTION:



MISPLACED ATTENTION:

REDUCTION

REDUCTION

REDUCTION

MISPLACED ATTENTION:

REDUCTION

THEN FIXATION

REDUCTION

MISPLACED ATTENTION:



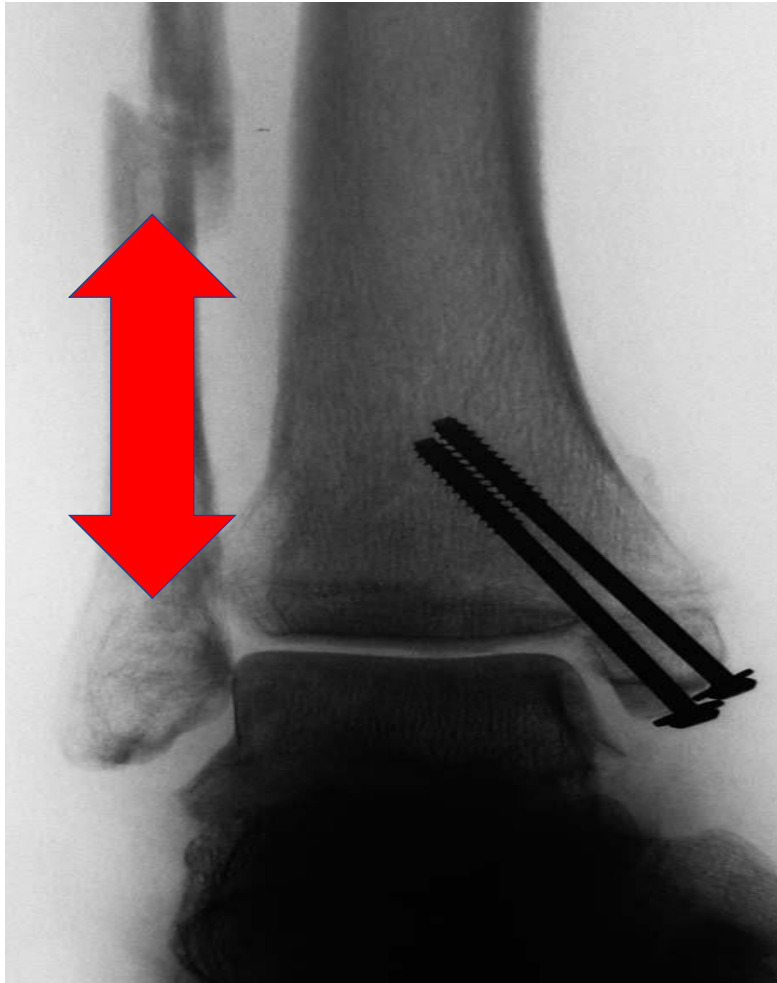
**FIXATION
MOOT POINT
IF REDUCTION
INCORRECT**

SDS REDUCTION TIPS:

RESTORE THE RELATIONSHIP:

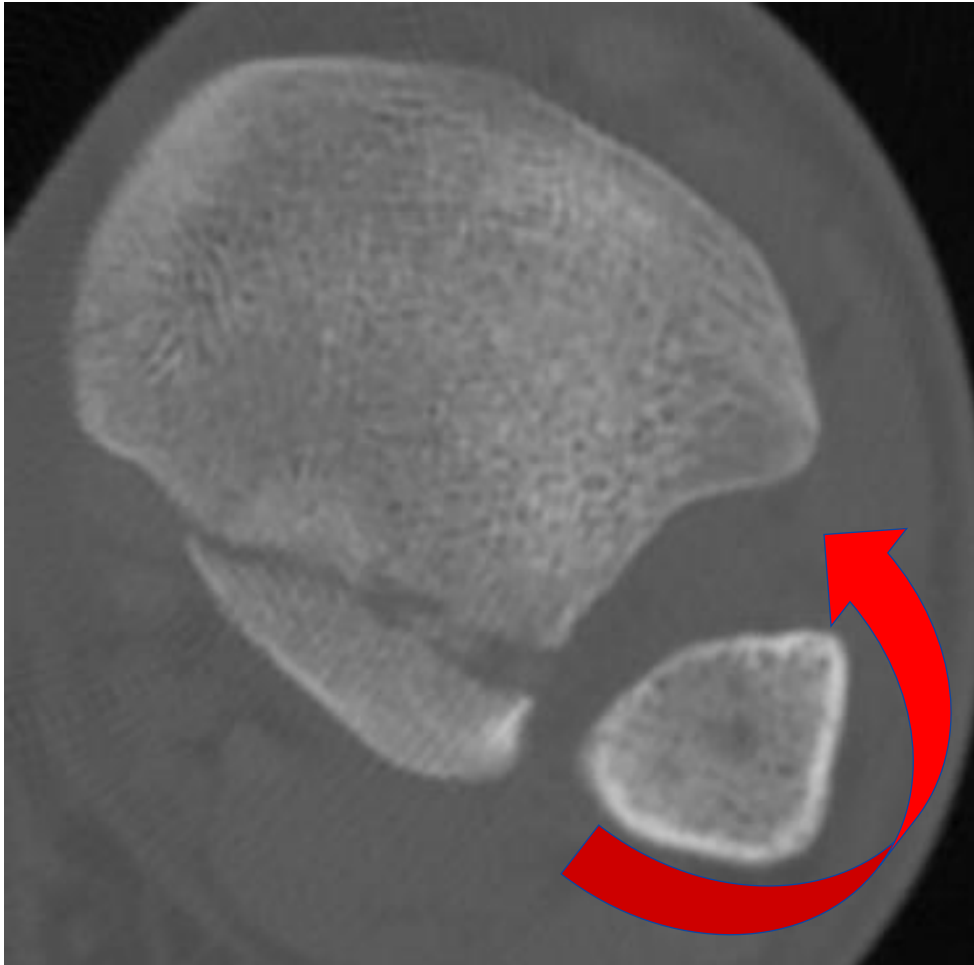


SDS REDUCTION:



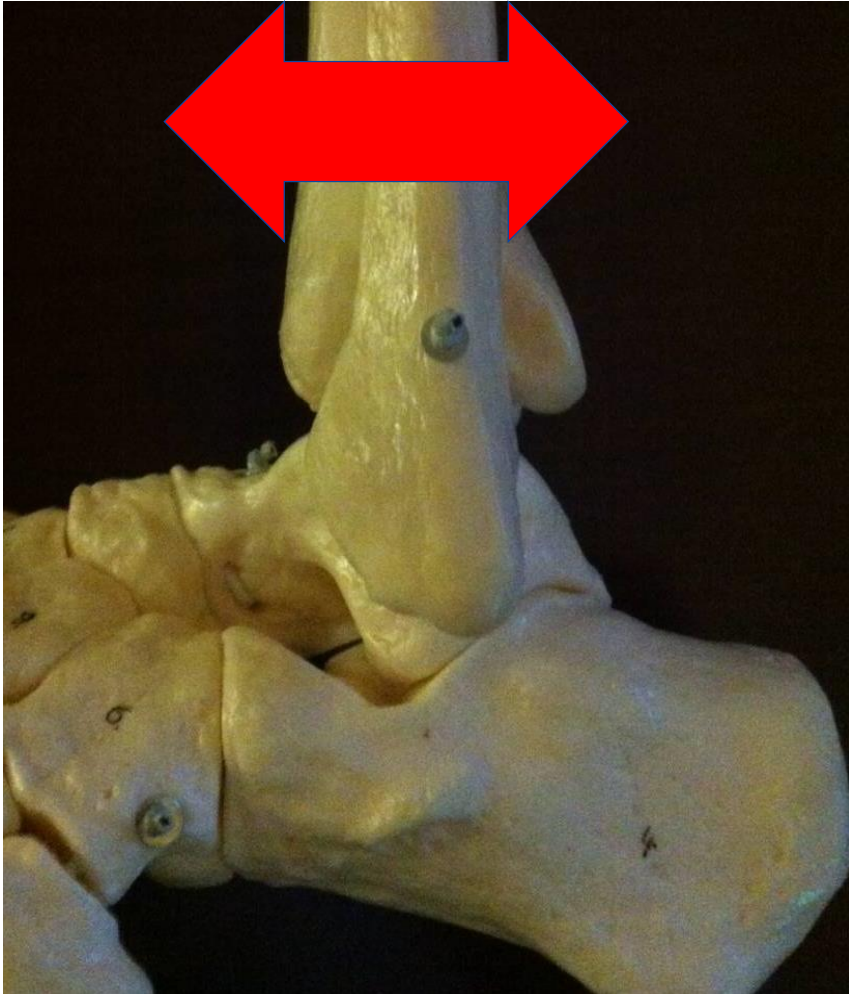
**RESTORE
FIBULA
LENGTH**

SDS REDUCTION:



**RESTORE
FIBULA
ROTATION**

SDS REDUCTION:



**RESTORE
FIBULA
TRANSLATION**

MISPLACED ATTENTION:



**FIXATION
MOOT POINT
IF REDUCTION
INCORRECT**

SDS REDUCTION

INDIRECT

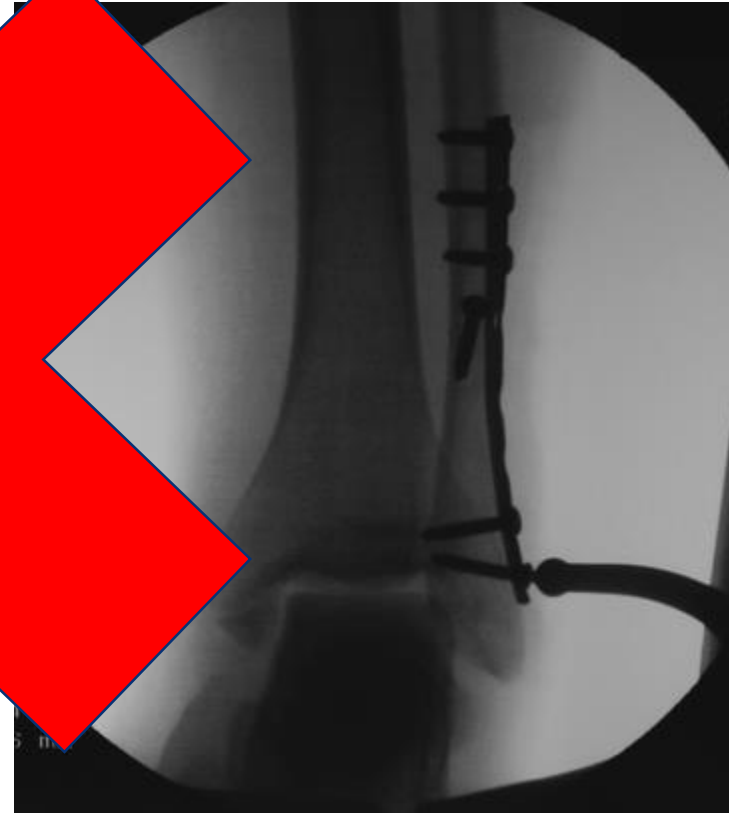
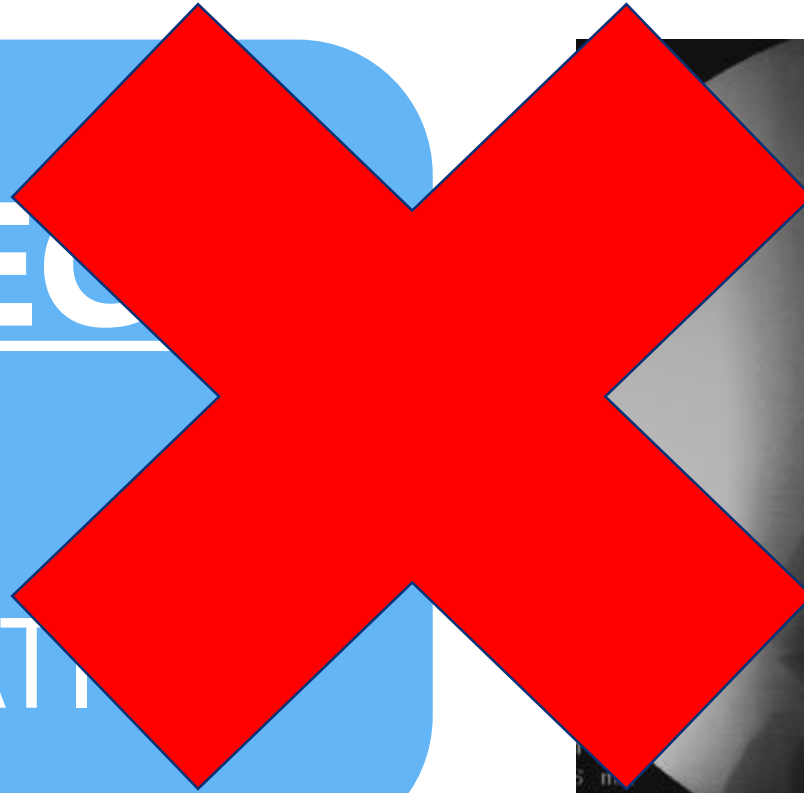
DIRECT

INDIRECT SDS REDUCTION

INDIRECT

NO

VISUALIZATION



DIRECT VS INDIRECT:

The Functional Consequence of Syndesmotic Joint Malreduction at a Minimum 2-Year Follow-Up

H. Claude Sagi, MD, Anjan R. Shah, MD, and Roy W. Sanders, MD



DIRECT VS INDIRECT:

MALREDUCTION:

INDIRECT - 40%

DIRECT VISUALIZATION – 15%

Trusted for our expertise. Chosen for our care.

**YOU MUST
LOOK AT IT!!!**







SDS FIXATION TIPS:

SDS FIXATION OPTIONS:

1

SCREWS



2

DIRECT SUTURE REPAIR



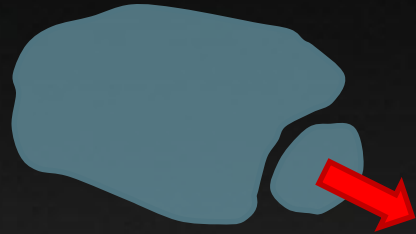
3

SUTURE BUTTON REPAIR

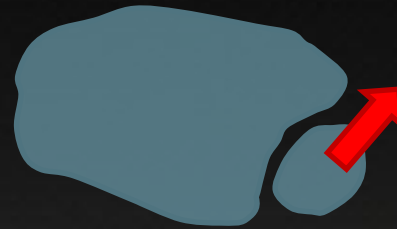


**SCREW
VS
SUTURE BUTTON**

Normal Syndesmotic Motion

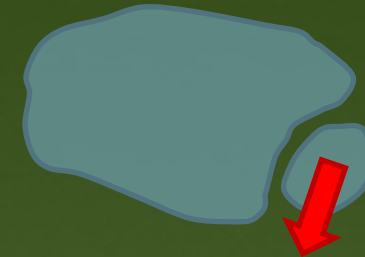


Coronal
Diastasis



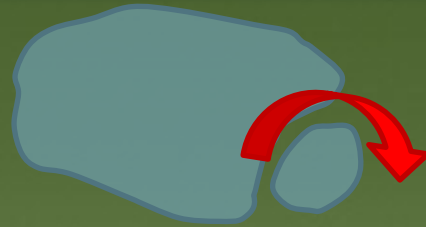
Sagittal
Anterior Translation

0.7mm +/- 1.7



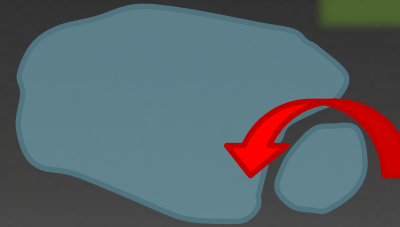
Sagittal
Posterior Translation

2.6mm +/- 1.5



Rotation
External

2.8° +/- 1.2°



Rotation
Internal

1.5° +/- 0.7°

SUTURE BUTTON EVIDENCE:

Better functional outcomes than screw at 1 y

- *Anderson OTA 2016*
- *Laflamme JOT 2015*

Equivalent functional outcomes to screw at 1-2y

- *Sanders OTA 2017*
- *Kortekangas Injury 2015*
- *Naqvi AJSM 2015*

Significant improvement in reduction versus screw

- *TNTC*

Improves *deliberate(!)* malreduction

- *Westermann JBJS 2014*

Faster return-to-play in elite athletes

- *Osbahr Orth Tod 2012*

More cost effective than screw

- *Neary AJSM 2017*

	SCREWS	SUTURE BUTTON
FIXATION	=	=
BIOMECHANICS	=	=
REMOVAL	-	+

	SCREWS	SUTURE BUTTON
FIXATION	=	=
BIOMECHANICS	=	=
REMOVAL	-	+
WB'ING	-	+

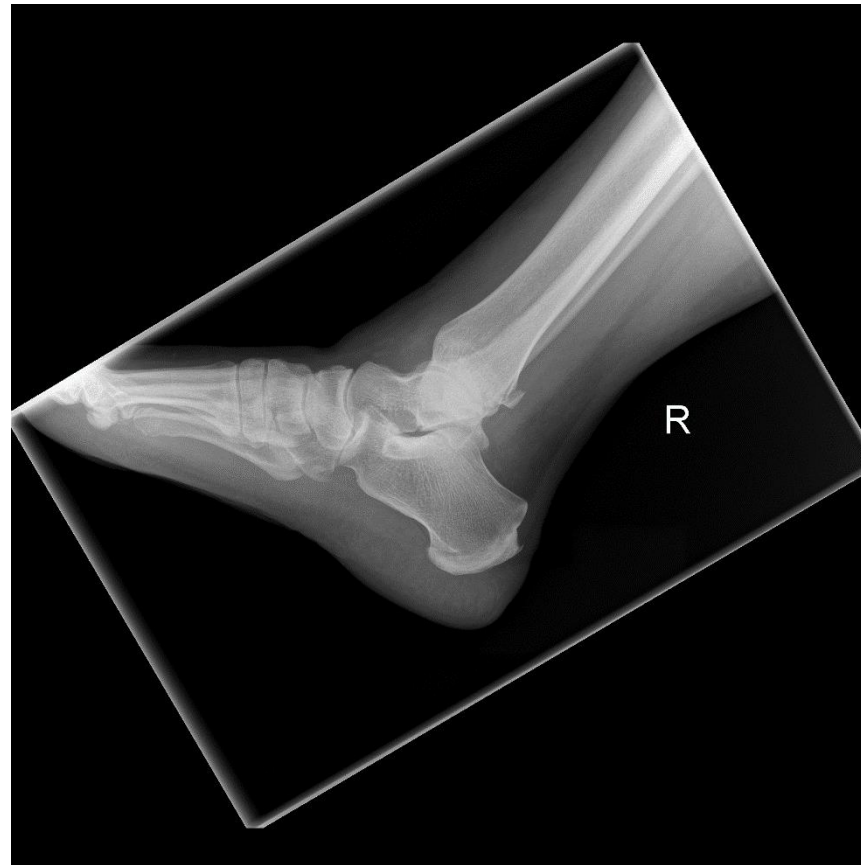
	SCREWS	SUTURE BUTTON
FIXATION	=	=
BIOMECHANICS	=	=
REMOVAL	-	+
WB'ING	-	+
MOTION	--	++

	SCREWS	SUTURE BUTTON
FIXATION	=	=
BIOMECHANICS	=	=
REMOVAL	-	+
WB'ING	-	+
MOTION	--	+++
PRICE	+	-

	SCREWS	SUTURE BUTTON
FIXATION	=	=
BIOMECHANICS	=	=
REMOVAL	-	+
WB'ING	-	+
MOTION	--	+++
PRICE	+	-
OUTCOMES	=	= (++++)

CASES

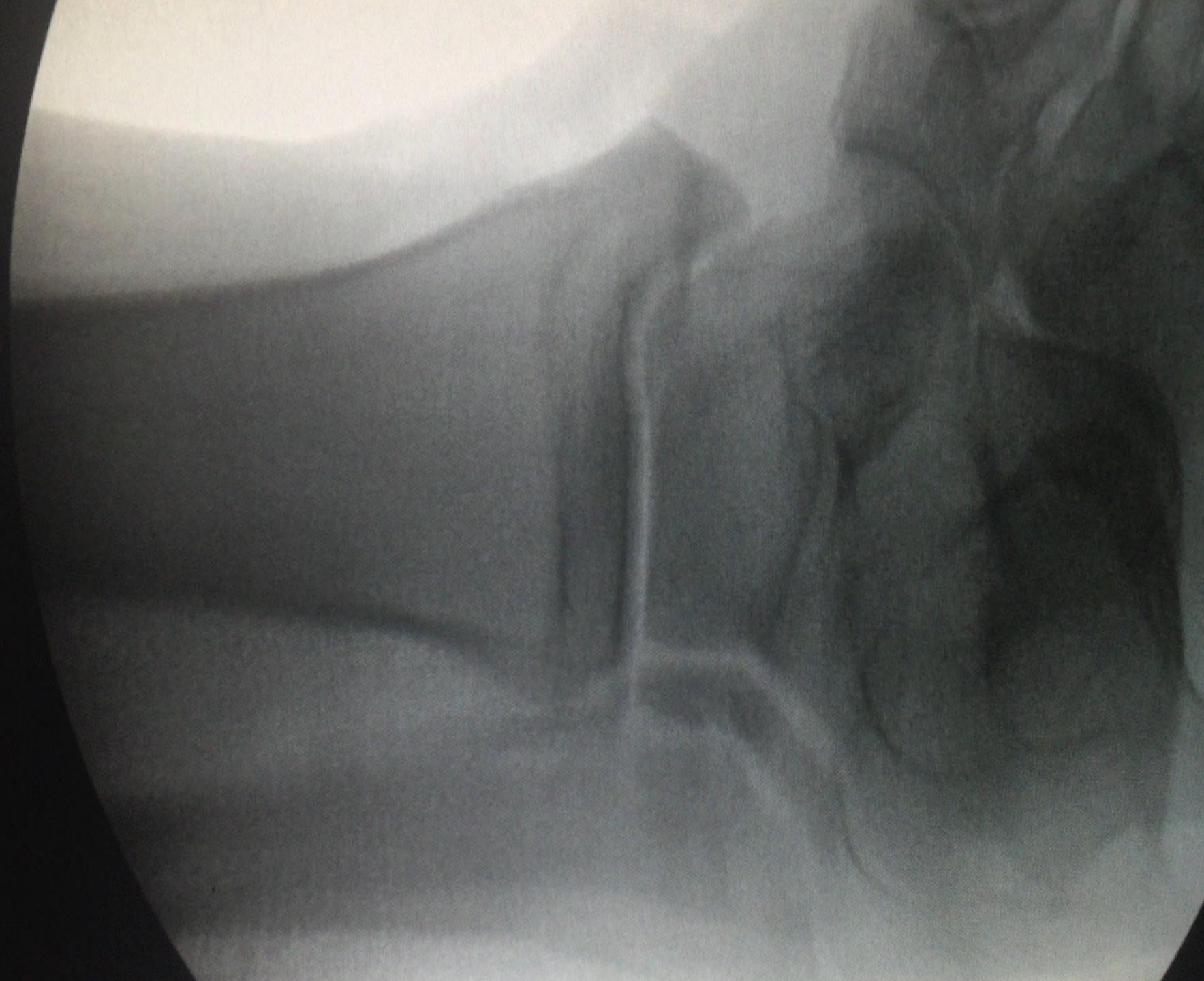
MAISONNEUVE *(BEWARE FIBULA LENGTH)*



3/10/2016 13:04:57



3/10/2016 13:04:57



GONZALEZ
ALINA
RIGHT ANKLE
4485485
HODGKINS
19630941
12/18/1968
F

DOCTOR'S HOSPITAL
03/10/2016
1:39:47 PM

GONZALEZ
ALINA
RIGHT ANKLE
4485485
HODGKINS
19630941
12/18/1968
F

DOCTOR'S HOSPITAL
03/10/2016
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STILL TOO SHORT

BETTER

GONZALEZ
ALINA
RIGHT ANKLE
4485485
HODGKINS
19630941
12/18/1968
F

DOCTOR'S HOSPITAL
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GONZALEZ
ALINA
RIGHT ANKLE
4485485
HODGKINS
19630941
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DOCTOR'S HOSPITAL
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35
27



34
24

GONZALEZ
ALINA
RIGHT ANKLE
4485485
HODGKINS
19630941
12/18/1968
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DOCTOR'S HOSPITAL
03/10/2016
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35 ☀
25 🌑

64 kVp
0.51 mA
17

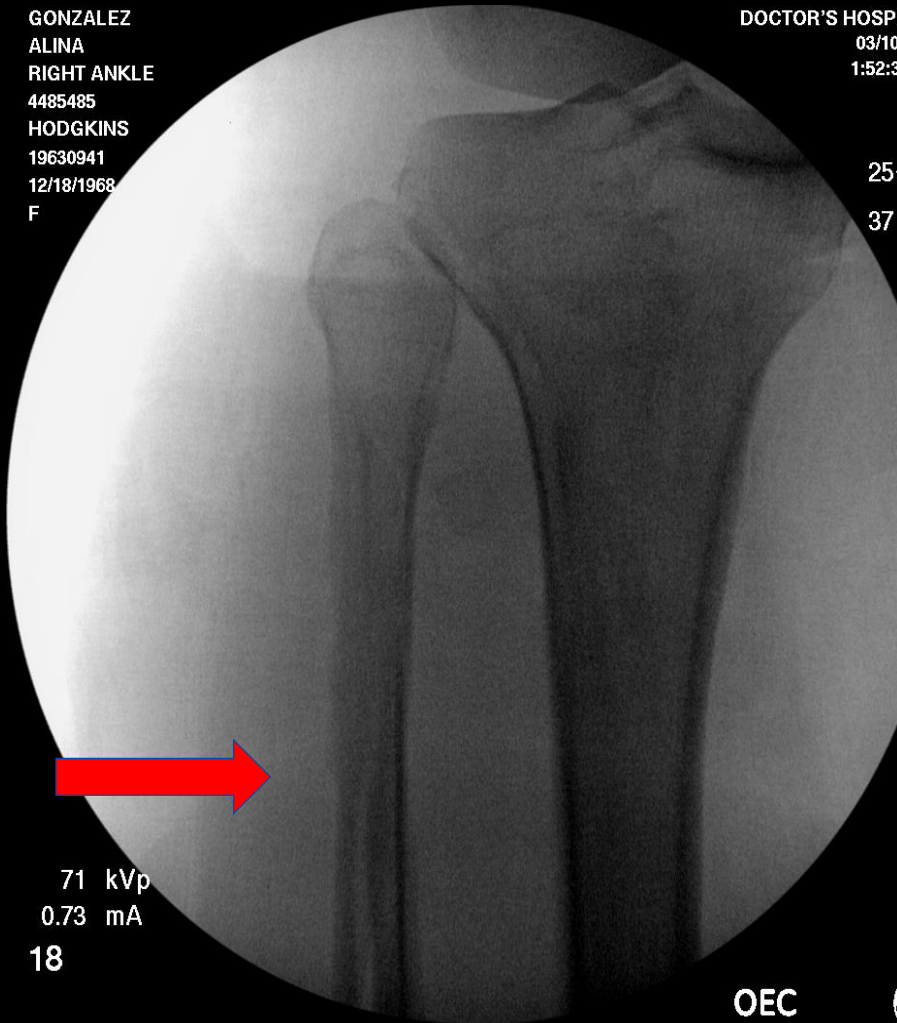
OEC



TIGHTROPE NOT ENOUGH TO HOLD LENGTH

GONZALEZ
ALINA
RIGHT ANKLE
4485485
HODGKINS
19630941
12/18/1968
F

DOCTOR'S HOSPI
03/10
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25
37



GONZALEZ
ALINA
RIGHT ANKLE
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HODGKINS
19630941
12/18/1968
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DOCTOR'S HOSPITAL
03/10/2016
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25
37



FIBULA LENGTH RESTORED



**1 YEAR
POST OP**

**THOROUGH EXAM,
MAGING BE SUSPICIOUS**

CT SCAN

**LOOK HARD INTRA OP –
PROVE STABLE**

SDS
GET
IT
RIGHT

**DIRECTLY VISUALIZE, TEST
AND REDUCE**

USE SUTURE BUTTON (S)

KEEP LEARNING!