Friday Night Lights

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Conflicts of Interest

- None

Objectives

By the end of today's sports medicine lecture, the learner will be able to:

1. Discuss the diagnosis and evaluation of sports related concussion.

2. Describe treatment and return to play approaches for patients with sports related concussion.

3. Outline diagnosis and treatment options for common football related fractures

Family Medicine Waiting Room

- Jordan R, WR Omaha South
- Frank J, SS Bellevue West
- Dillon S, Band Parent, Millard West
- Hannah B, Cheerleader, Blair
- Jacob M, WR, Omaha South
- Benjamin N, CB, Papio South
- Chris S, RB, Creighton Prep
- Hudson M, QB, Omaha Burke

Jordan R 16 y/o

- Sophomore; Plays WR at Omaha South HS
- Suffered a hard hit while covering a kick off return; helmet alerted.
- Showed signs/symptoms concerning for concussion and pulled from the game.
- Today complaining of only mild headache and sleep issues; normal per patient.
- Taking Tylenol for headache
- Suffered concussion back in 8th grade football. Missed 10 days of practice/games
- MOP wants patient to be ”tested” for a concussion.
- Patient wants to be cleared to return to practice today; rivalry game this week

Jordan R; Omaha South WR

- SCAT 5 Symptom Score: 12
- SCAT 5 Severity Score: 23

STEP 2: SYMPTOM EVALUATION

The athlete should be given the symptom form and asked to read this instruction paragraph out loud then complete the symptom scale. For the baseline assessment, the athlete should rate his/her symptoms based on how he/she typically feels and for the post injury assessment the athlete should rate their symptoms at this point in time.

Please Check: ☐ **Baseline** ☐ **Post-Injury**

Please hand the form to the athlete

	none	mild		moderate		severe	
Headache	0	1	2	3	4	5	6
"Pressure in head"	0	1	2	3	4	5	6
Neck Pain	0	1	2	3	4	5	6
Nausea or vomiting	0	1	2	3	4	5	6
Dizziness	0	1	2	3	4	5	6
Blurred vision	0	1	2	3	4	5	6
Balance problems	0	1	2	3	4	5	6
Sensitivity to light	0	1	2	3	4	5	6
Sensitivity to noise	0	1	2	3	4	5	6
Feeling slowed down	0	1	2	3	4	5	6
Feeling like "in a fog"	0	1	2	3	4	5	6
"Don't feel right"	0	1	2	3	4	5	6
Difficulty concentrating	0	1	2	3	4	5	6
Difficulty remembering	0	1	2	3	4	5	6
Fatigue or low energy	0	1	2	3	4	5	6
Confusion	0	1	2	3	4	5	6
Drowsiness	0	1	2	3	4	5	6
More emotional	0	1	2	3	4	5	6
Irritability	0	1	2	3	4	5	6
Sadness	0	1	2	3	4	5	6
Nervous or Anxious	0	1	2	3	4	5	6
Trouble falling asleep (if applicable)	0	1	2	3	4	5	6
Total number of symptoms:							of 22
Symptom severity score:							of 132
Do your symptoms get worse with physical activity?						Y	N
Do your symptoms get worse with mental activity?						Y	N

Jordan; Omaha South WR

- V/S: HR 80, T 98.3, BP 112/60
- MSK: Cervical spine full pain free ROM. Very mild paraspinal ttp. Mild occiput ttp
- Neuro: CN 2-12 intact, UE/LE strength 5/5, patellar and achilles reflex brisk +2
  - SCAT 5 testing: normal orientation, 5/5 immediate recall, 3/5 concentration, 3/5 delayed recall, Balance testing: 5/7/8, difficulty walking straight line, subtle difficulty with finger to nose testing. VOMS testing caused increase in symptoms.

IMMEDIATE MEMORY

The Immediate Memory component can be completed using the traditional 5-word per trial list or optionally using 10-words per trial to minimise any ceiling effect. All 3 trials must be administered irrespective of the number correct on the first trial. Administer at the rate of one word per second.

Please choose EITHER the 5 or 10 word list groups and circle the specific word list chosen for this test.

I am going to test your memory. I will read you a list of words and when I am done, repeat back as many words as you can remember, in any order. For Trials 2 & 3: I am going to repeat the same list again. Repeat back as many words as you can remember in any order, even if you said the word before.

List	Alternate 5 word lists					Score (of 5) Trial 1	Trial 2	Trial 3
A	Finger	Penny	Blanket	Lemon	Insect			
B	Candle	Paper	Sugar	Sandwich	Wagon			
C	Baby	Monkey	Perfume	Sunset	Iron			
D	Elbow	Apple	Carpet	Saddle	Bubble			
E	Jacket	Arrow	Pepper	Cotton	Movie			
F	Dollar	Honey	Mirror	Saddle	Anchor			
					Immediate Memory Score			of 15
					Time that last trial was completed			

List	Alternate 10 word lists					Score (of 10) Trial 1	Trial 2	Trial
G	Finger	Penny	Blanket	Lemon	Insect			
	Candle	Paper	Sugar	Sandwich	Wagon			
H	Baby	Monkey	Perfume	Sunset	Iron			
	Elbow	Apple	Carpet	Saddle	Bubble			
I	Jacket	Arrow	Pepper	Cotton	Movie			
	Dollar	Honey	Mirror	Saddle	Anchor			
					Immediate Memory Score			of 30
					Time that last trial was completed			

DIGITS BACKWARDS

Please circle the Digit list chosen (A, B, C, D, E, F). Administer at the rate of one digit per second reading DOWN the selected column.

I am going to read a string of numbers and when I am done, you repeat them back to me in reverse order of how I read them to you. For example, if I say 7-1-9, you would say 9-1-7.

Concentration Number Lists (circle one)					
List A	List B	List C			
4-9-3	5-2-6	1-4-2	Y	N	0
6-2-9	4-1-5	6-5-8	Y	N	1
3-8-1-4	1-7-9-5	6-8-3-1	Y	N	0
3-2-7-9	4-9-6-8	3-4-8-1	Y	N	1
6-2-9-7-1	4-8-5-2-7	4-9-1-5-3	Y	N	0
1-5-2-8-6	6-1-8-4-3	6-8-2-5-1	Y	N	1
7-1-8-4-6-2	8-3-1-9-6-4	3-7-6-5-1-9	Y	N	0
5-3-9-1-4-8	7-2-4-8-5-6	9-2-6-5-1-4	Y	N	1

MONTHS IN REVERSE ORDER

Now tell me the months of the year in reverse order. Start with the last month and go backward. So you'll say December, November. Go ahead.

Dec - Nov - Oct - Sept - Aug - Jul - Jun - May - Apr - Mar - Feb - Jan	0 1
Months Score	of 1
Concentration Total Score (Digits + Months)	of 5

STEP 4: NEUROLOGICAL SCREEN

See the instruction sheet (page 7) for details of test administration and scoring of the tests.

Can the patient read aloud (e.g. symptom check-list) and follow instructions without difficulty?	Y	N
Does the patient have a full range of pain-free PASSIVE cervical spine movement?	Y	N
Without moving their head or neck, can the patient look side-to-side and up-and-down without double vision?	Y	N
Can the patient perform the finger nose coordination test normally?	Y	N
Can the patient perform tandem gait normally?	Y	N

BALANCE EXAMINATION

Modified Balance Error Scoring System (mBESS) testing[5]

Which foot was tested (i.e. which is the non-dominant foot) ☐ Left ☐ Right

Testing surface (hard floor, field, etc.) _____

Footwear (shoes, barefoot, braces, tape, etc.) _____

Condition	Errors
Double leg stance	of 10
Single leg stance (non-dominant foot)	of 10
Tandem stance (non-dominant foot at the back)	of 10
Total Errors	of 30

Balance testing – types of errors

1. Hands lifted off iliac crest
2. Opening eyes
3. Step, stumble, or fall
4. Moving hip into > 30 degrees abduction
5. Lifting forefoot or heel
6. Remaining out of test position > 5 sec

Vestibular/Ocular-Motor Screening (VOMS) for Concussion

Vestibular/Ocular Motor Test:	Not Tested	Headache 0-10	Dizziness 0-10	Nausea 0-10	Fogginess 0-10	Comments
BASELINE SYMPTOMS:	N/A					
Smooth Pursuits						
Saccades – Horizontal						
Saccades – Vertical						
Convergence (Near Point)						(Near Point in cm): Measure 1: _____ Measure 2:_____ Measure 3:_____
VOR – Horizontal						
VOR – Vertical						
Visual Motion Sensitivity Test						

Instructions:

DIAGNOSIS?

Sports Related Concussion

- Clinical diagnosis…no “test” for it
  - “Smart” Helmets
- Normal recovery time
- Avoid NSAIDS and sleeping medications
  - Majority of headaches come from cervical strain; heat, ROM, occipital release exercises
- Gradual return to school and play protocols
- If unsure of patient recovery, consider computer testing
- If questions/concerns, consider referral.

Table 4 Return to learn

Facilitate communication and transition back to school.

- Notify school personnel after injury to prepare for return to school.
  - Obtain consent for communication between medical and school teams.
- Designate point person to monitor the student's status related to academics, recovery and coping with injury, and communicate with medical team.
  - School health professional, guidance counsellor, administrator, athletic trainer.
- Develop plan for missed assignments and exams.
- Adjust schedule to accommodate reduced or modified attendance if needed.

Classroom adjustments

- Breaks as needed during school day.
- Reduce inclass assignments and homework.
- Allow increased time for completion of assignments and testing.
- Delay exams until student is adequately prepared and symptoms do not interfere with testing.
- Allow testing in a separate, distraction-free environment.
- Modify due dates or requirements for major projects.
- Provide preprinted notes or allow peer notetaker.
- Avoid high-risk or strenuous physical activity.

School environment adjustments

- Allow use of headphones/ear plugs to reduce noise sensitivity.
- Allow use of sunglasses/hat to reduce light sensitivity.
- Limit use of electronic screens or adjust screen settings, including font size, as needed.
- Allow student to leave class early to avoid crowded hallways.
- Avoid busy, crowded or noisy environments—music room, hallways, lunch room, vocational classes, assemblies.

Clinicians should individualise adjustments based on patient-specific symptoms, symptom severity, academic demands, as well as pre-existing conditions, such as mood disorder, learning disability or attention deficit/hyperactivity disorder.[87 88]

Athletes with complicated or prolonged recovery may require a multidisciplinary team with specific expertise across the scope of concussion management.

Table 5 Return to sport

Stage	Description	Objective
1	Symptom-limited activity	Reintroduction of normal activities of daily living. Symptoms should not worsen with activity.
2	Light aerobic exercise	Walking, stationary biking, controlled activities that increase heart rate.
3	Sport-specific exercise	Running, skating or other sport-specific aerobic exercise avoiding risk of head impact.
4	Non-contact training drills	Sport-specific, non-contact training drills that involve increased coordination and thinking. Progressive introduction of resistance training.
5	Full contact practice	Return to normal training activities. Assess psychological readiness.
6	Return to sport	

Return-to-sport progressions should be individualised based on the injury, athlete's age, history and level of play, and the ability to provide close supervision during the return to activity, and progressions may vary between athletes. Each stage is generally 24 hours without return of concussion symptoms. Consider written clearance from a healthcare professional before return to sport as directed by local laws and regulations.[3]

Consensus statement

American Medical Society for Sports Medicine position statement on concussion in sport

Kimberly G Harmon,[1] James R Clugston,[2] Katherine Dec,[3] Brian Hainline,[4] Stanley Herring,[5] Shawn F Kane,[6] Anthony P Kontos,[7] John J Leddy,[8] Michael McCrea,[9] Sourav K Poddar,[10] Margot Putukian,[11,12] Julie C Wilson,[13] William O Roberts[14]

For numbered affiliations see

ABSTRACT

position statement on SRC was published in 2013

Br J Sports Med: first published

Jordan Case Summary

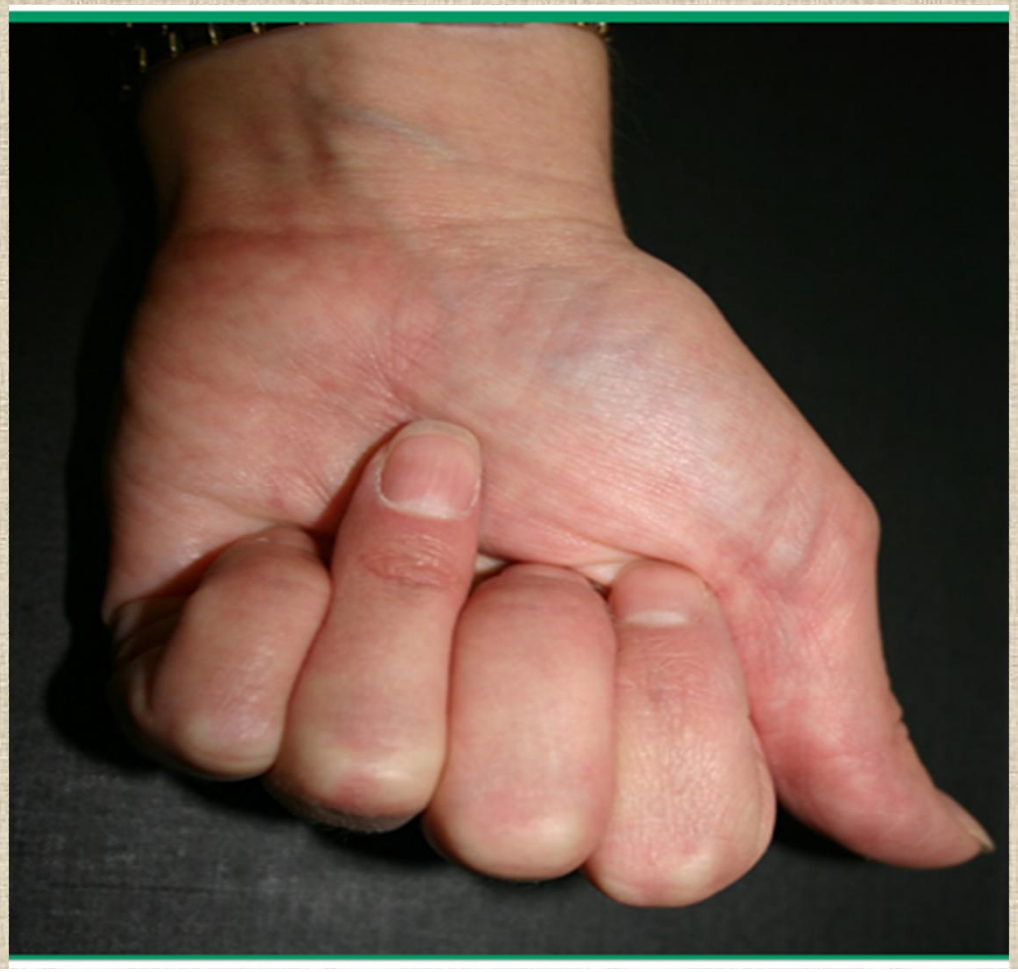
- Sports Related Concussion
- Clinical Diagnosis
- Symptom free at 10 days
- Entered return to learn and return to play protocols without issue.
- Return to game activity 2 weeks after injury
- No further injuries during the season despite helmet “alarming” several times at practice

WAITING ROOM

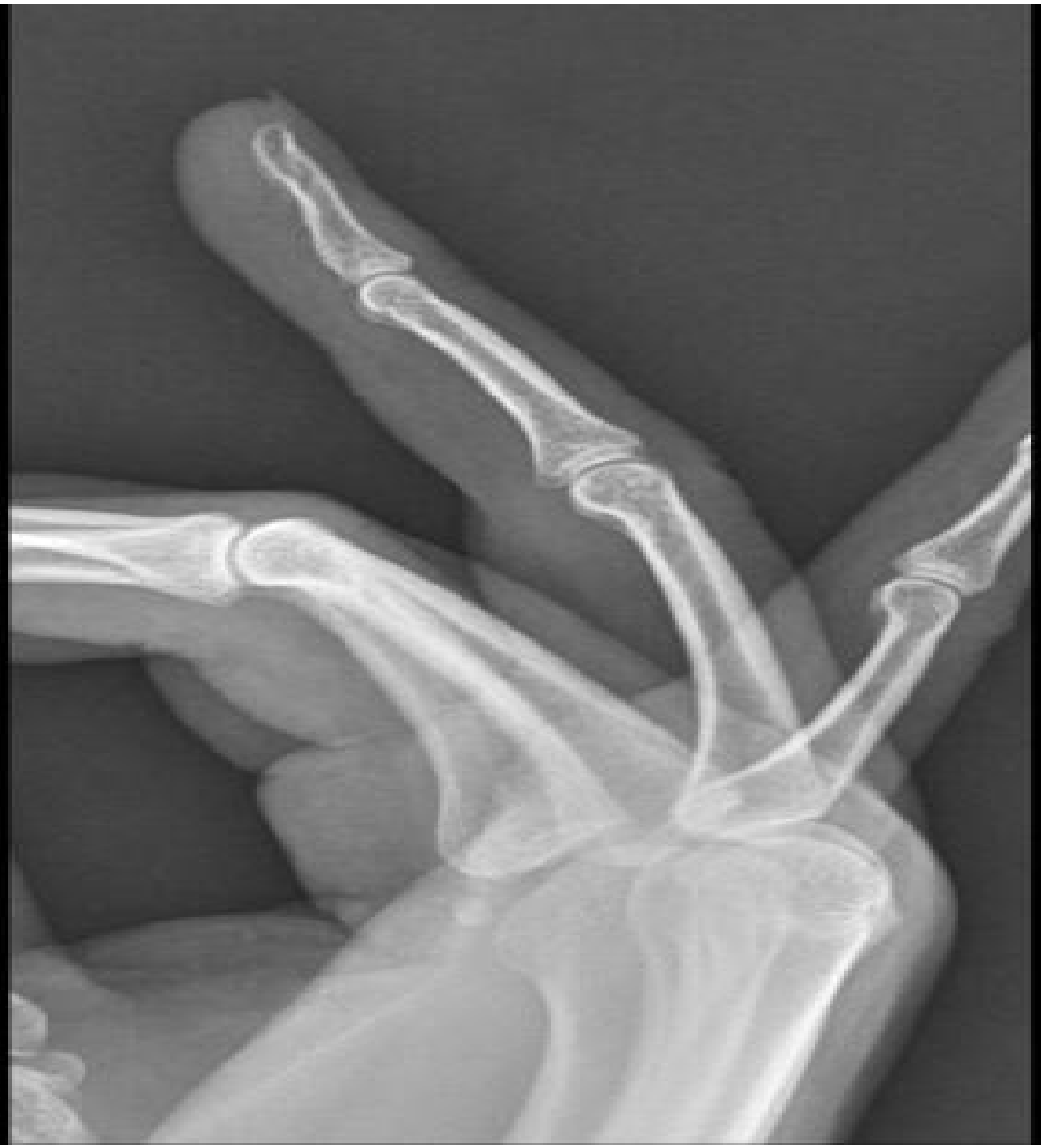
Frank J; 15 y/o

- Strong Safety @ Bellevue West
- Went to tackle a running back in the open field and only grabbed his jersey
- Felt a pop in his right ringer finger
- Immediate pain and inability to make a fist but continued to play the rest of the game.

Frank J, Bellevue West Strong Safety



Courtesy of Rebecca Bassett, MD. UTD



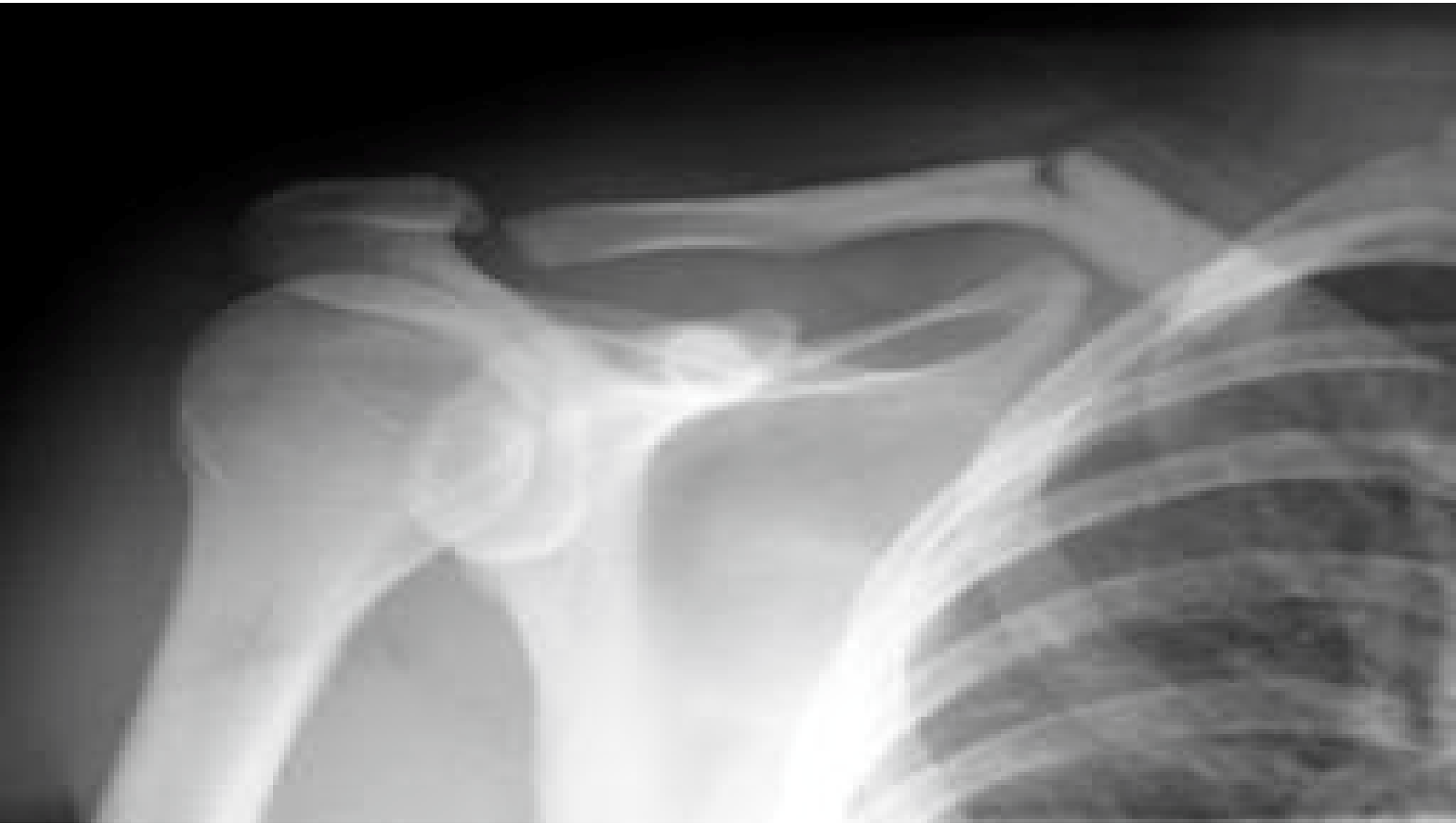
DIAGNOSIS?

TREATMENT?

WAITING ROOM

Dillon, 42 y/o ”Band Dad” @Millard West

- Band parent fell trying to move instruments after half time performance.
- Landed on right shoulder. Immediate pain and inability to move right arm.
- Went to Emergency Room secondary to pain.
- In a 35 minute discussion, the long and short is that he broke something but isn’t sure exactly what he did
- In a sling currently, here for definitive treatment.



DIAGNOSIS?

Clavicle Fractures

Fracture Classification

- Proximal
  - Look for other injuries (Up to 90% of these have associated neck, thoracic, or vascular injuries.)
  - CT scan if have any questions
  - If non-displaced and no injuries, treat with sling
- Mid-substance
  - If ends touch, you can treat them….sling
- Distal
  - Displaced-> OR
  - Non-displaced -> Sling
  - Intraarticular AC joint fracture -> Sling **

WAITING ROOM

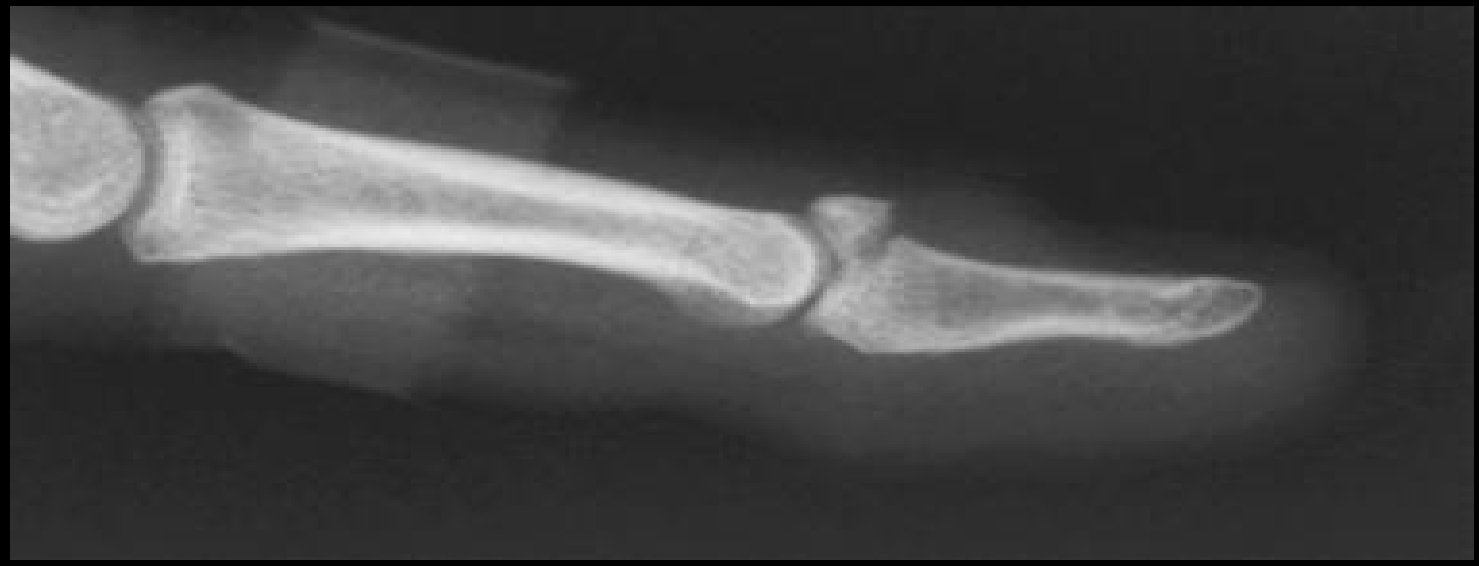
Hannah B, 18 y/o F

- Cheerleader at Blair HS
- Jammed her finger during a stunting routine
- Immediate pain over the DIP of the third digit; can't move it secondary to pain
- Has been using ice and taking naproxen

Hannah Blair HS Cheerleader

- VS: Normal
- Right hand
  - Inspection: No rotational deformity of 3rd digit; subtle extensor lag
  - Palpation: TTP over dorsal DIP
  - ROM: Limited
  - Strength: Full flexion of DIP; Limited active extension

DIAGNOSIS?



Treatment

- Conservative vs operative management
- Extension in full extension for 6 weeks
- Additional 3-6 weeks with sleep and activity

WAITING ROOM

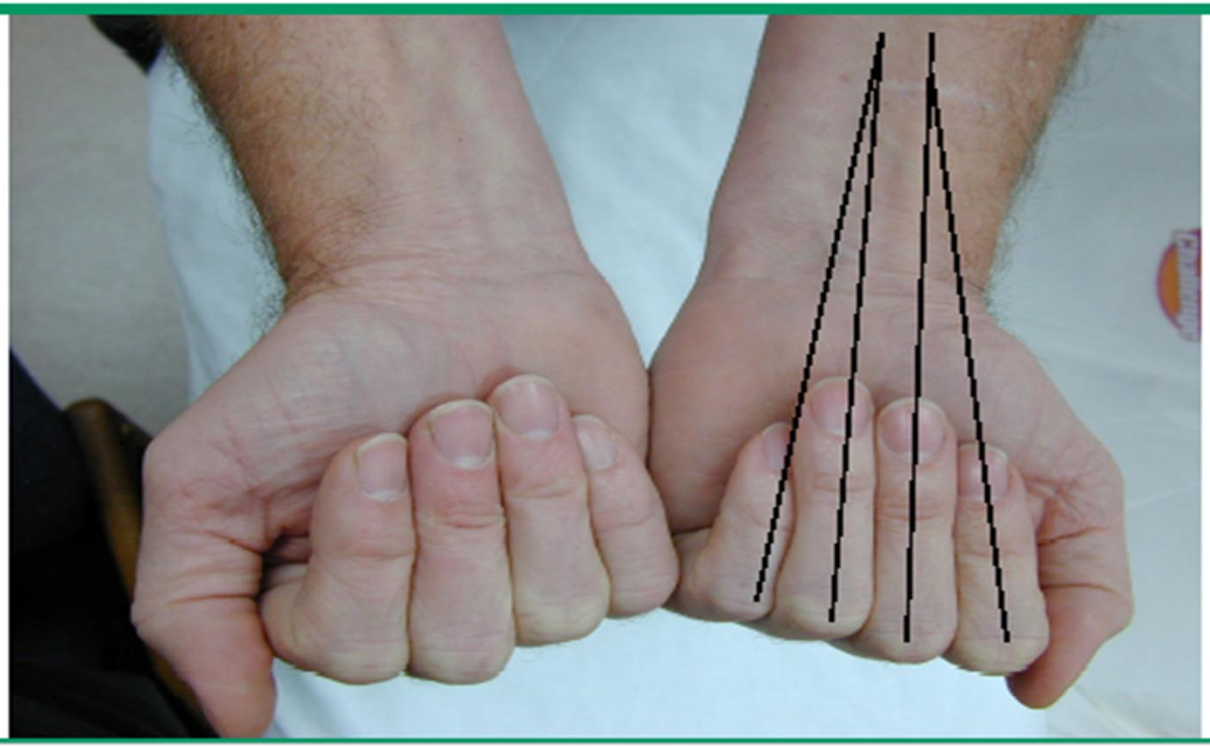
Jacob M 18 y/o

- RHD LB at Omaha North
- Can't remember exactly what happened, but went in for tackle and hit this opponents helmet with his hand.
- Immediate pain and swelling with inability to move right hand afterwards.
- Seen in ED where films obtained and he was placed in splint.
- Here today for definitive treatment

Physical Examination (after splint removed)

- V/S: normal
- Right hand
  - Inspection: Moderate effusion, ecchymosis over ulnar aspect of his hand
  - TTP over 5th MC head/neck
  - ROM: Limited secondary to pain
  - No obvious rotational deformity on examination

Examination for malrotation of metacarpals

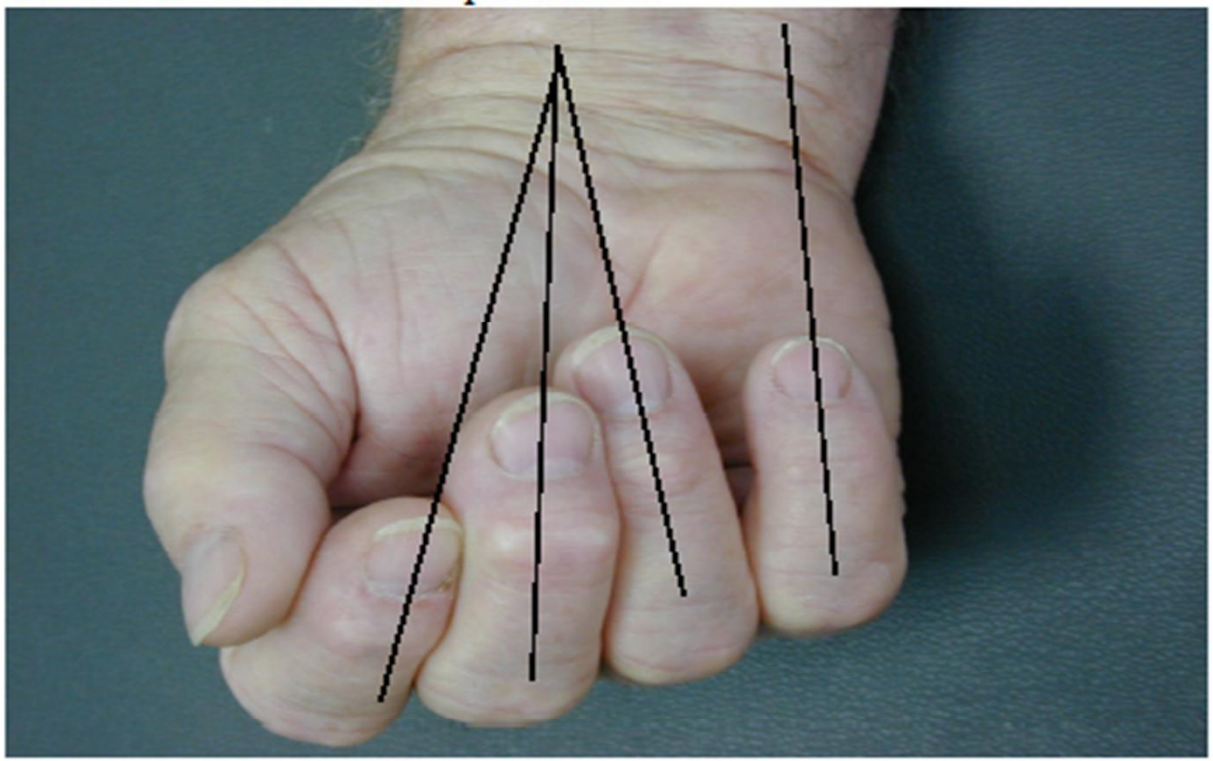


The MCP and PIP joints are flexed to 90 degrees in this photograph of two normal hands. Axial lines drawn through the middle and distal phalanges of the second through fifth digits are nearly parallel and converge near the wrist.

MCP: metacarpophalangeal; PIP: proximal interphalangeal.

Courtesy of Kevin Burroughs, MD.

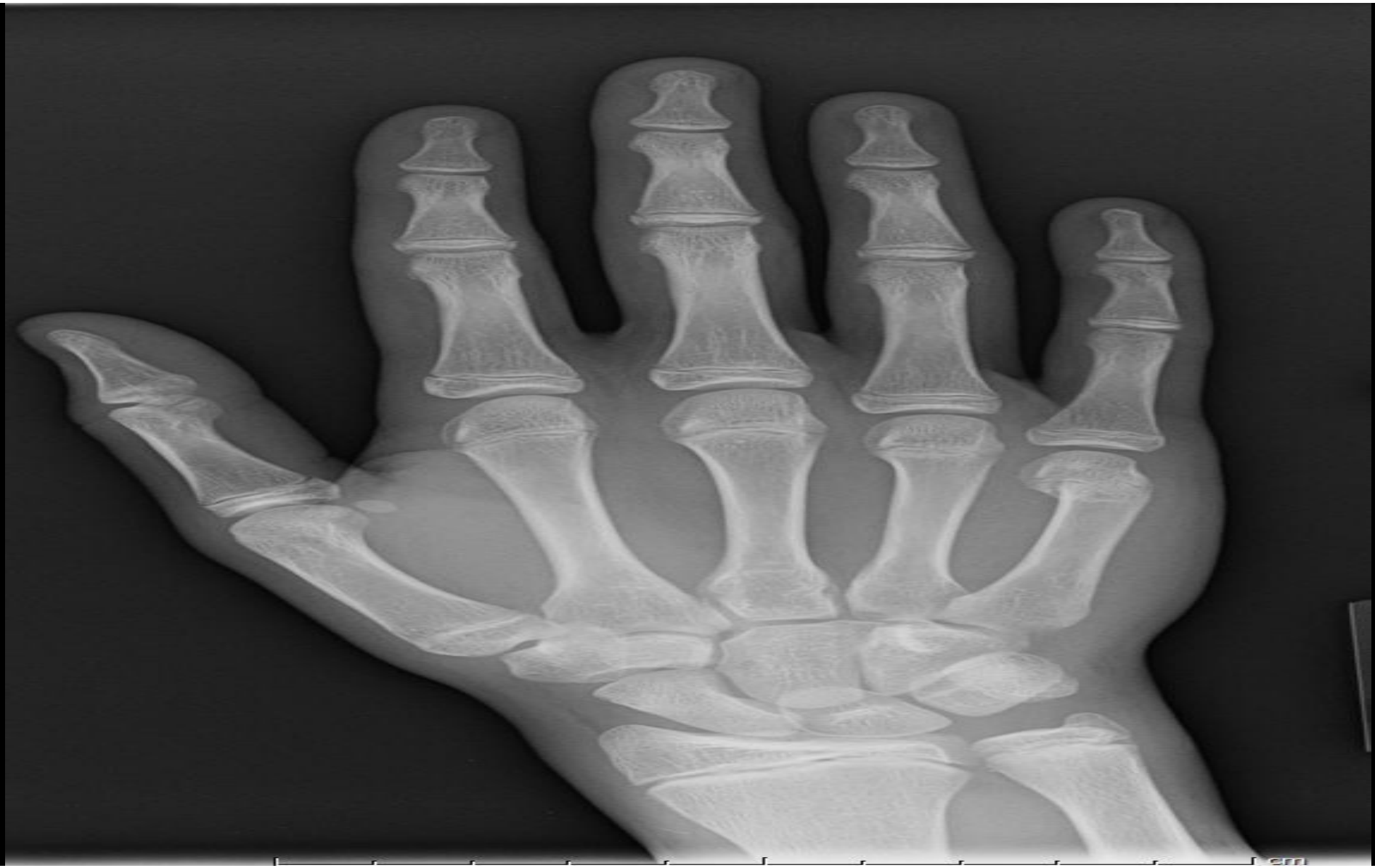
Malrotation due to metacarpal fracture

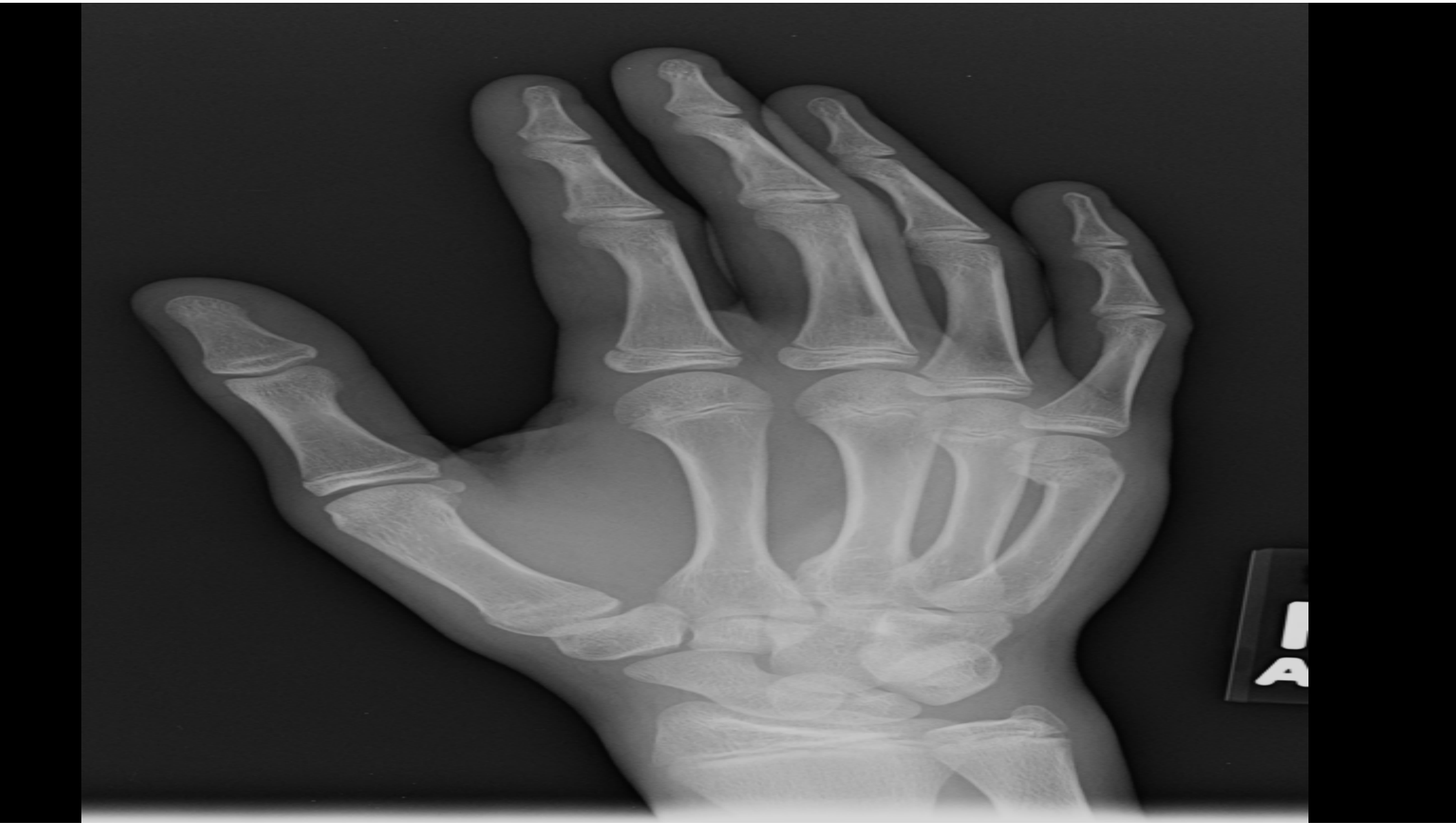


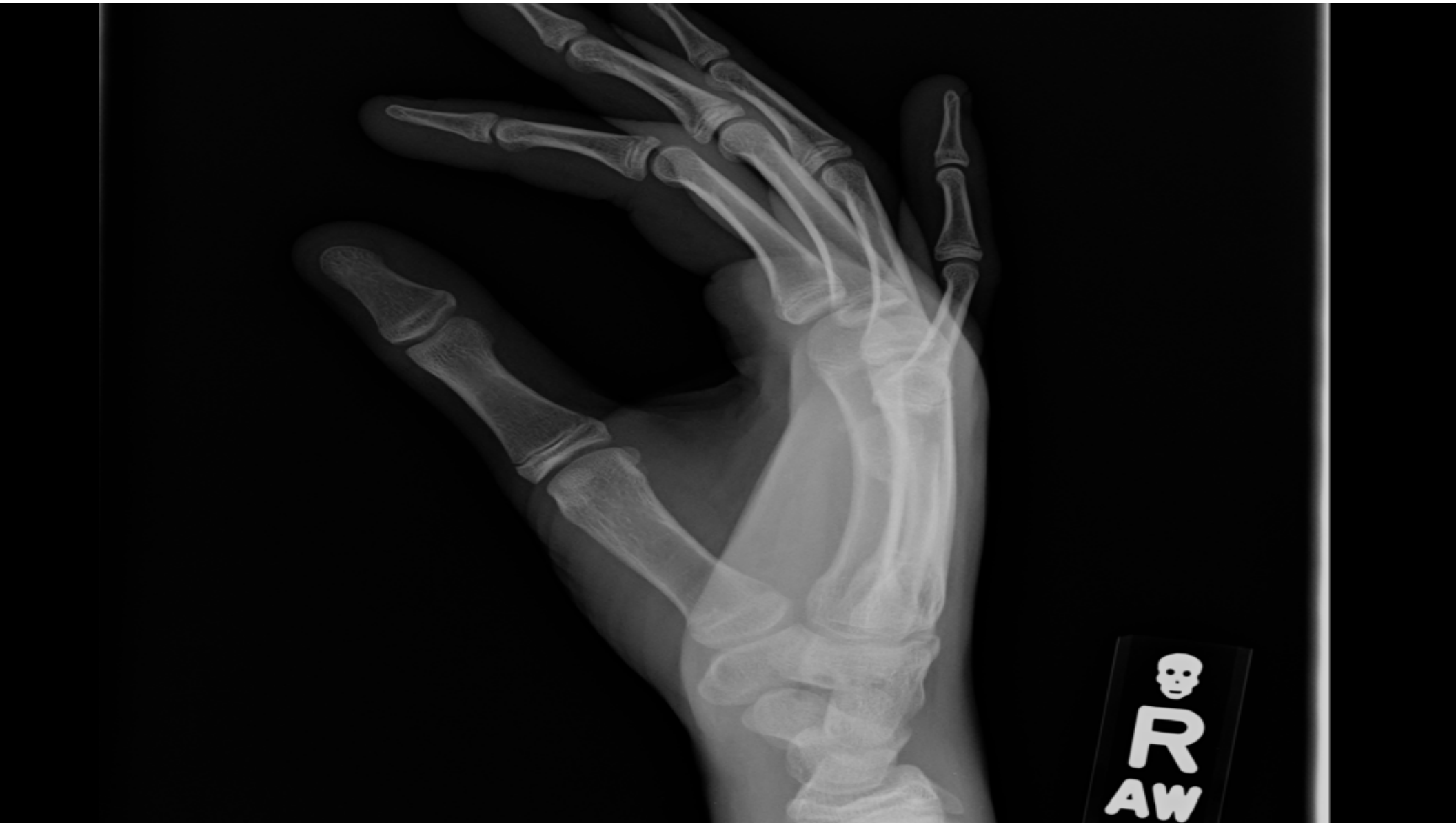
The axes of the fingers normally converge when the MCP and PIP joints are both flexed. In this photograph, while the second, third, and fourth fingers converge as they should, the fifth does not. The divergence of the fifth digit is the result of a fifth metacarpal shaft fracture complicated by malrotation.

MCP: metacarpophalangeal; PIP: proximal interphalangeal.

Courtesy of Kevin Burroughs, MD.






R
AW

DIAGNOSIS?

Treatment

- Conservative vs operative management
  - 10/20/30/40 rule
  - Don’t forget normal MC neck angulation
- Splint vs brace vs cast
- Return to football

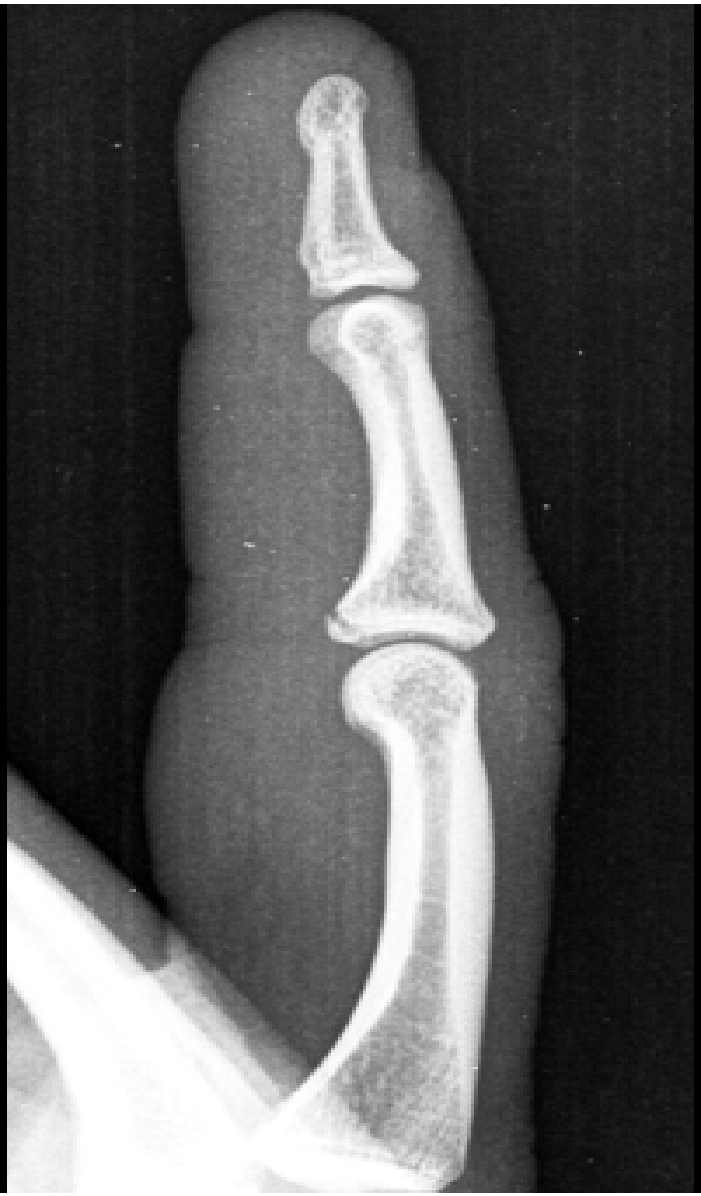
WAITING ROOM

Benjamin N, 18 y/o

- Cornerback at Papillion LaVista South High School
- Deflected a pass during the game and jammed his finger
- Played the rest of the game
- Pain over his palmar aspect of his index finger
- Buddy taped after the injury and has continued to do this. Provides moderate pain control
- Using ibuprofen and ice prn

Examination

- V/S: normal
- Right index finger
  - Inspection: no obvious gross abnormalities. No rotational deformities. Swelling over the PIP. Ecchymosis over the PIP
  - Palpation: TTP over the palmar aspect PIP
  - ROM: Limited flexion at PIP. Resisted flexion and extension at DIP and PIP intact
  - NVI
  - Special test: Mild valgus laxity



DIAGNOSIS?

Volar Plate and Collateral Ligament Injury

- Buddy taping vs splinting for 4-6 weeks
- Aggressive icing
- Can play if strength full as long as taped

WAITING ROOM

Chris S, 17 y/o

- Running back at Creighton Prep
- Rolled his left ankle at the game Friday night; missed rest of game
- Has been using crutches secondary to pain
- No previous ankle injuries

Inspection: See image

Palpation:

Bony: TTP over posterior medial and lateral malleoli, ttp over base of 5th MT

Soft tissue: pan positive

ROM: Limited in all planes secondary to pain

Strength: 5/5

Neuro: decrease in ability to feel touch over lateral column of foot

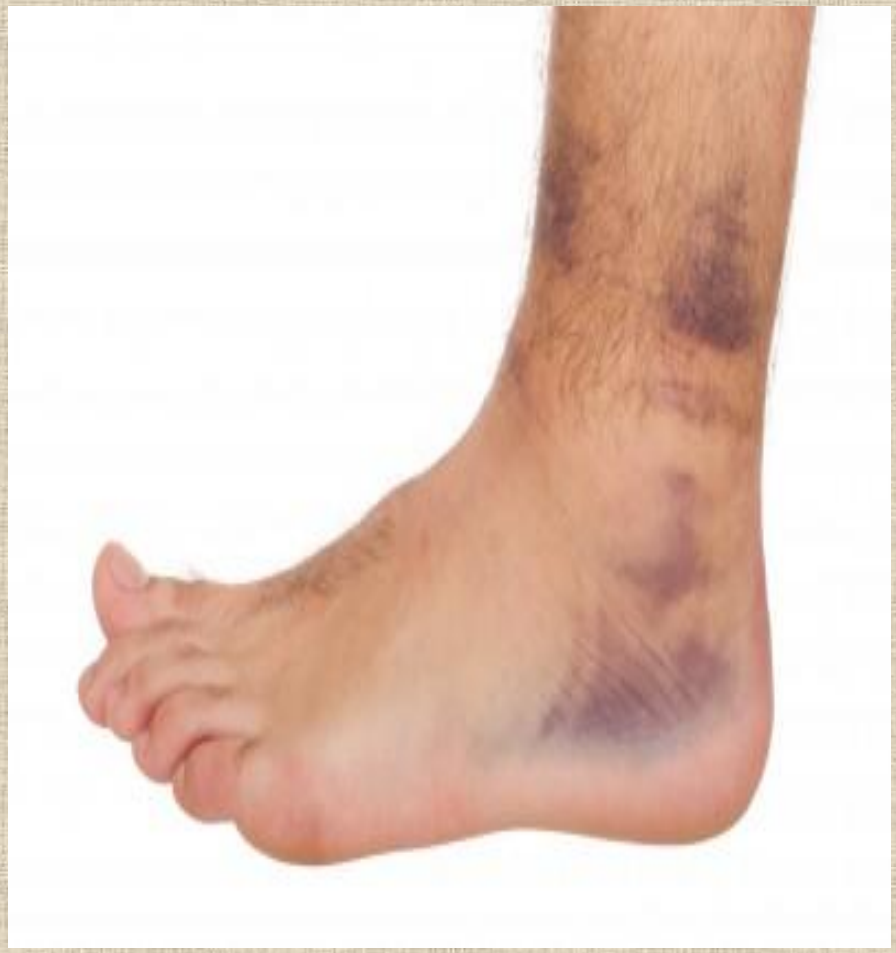
Special test:

Negative Thompson

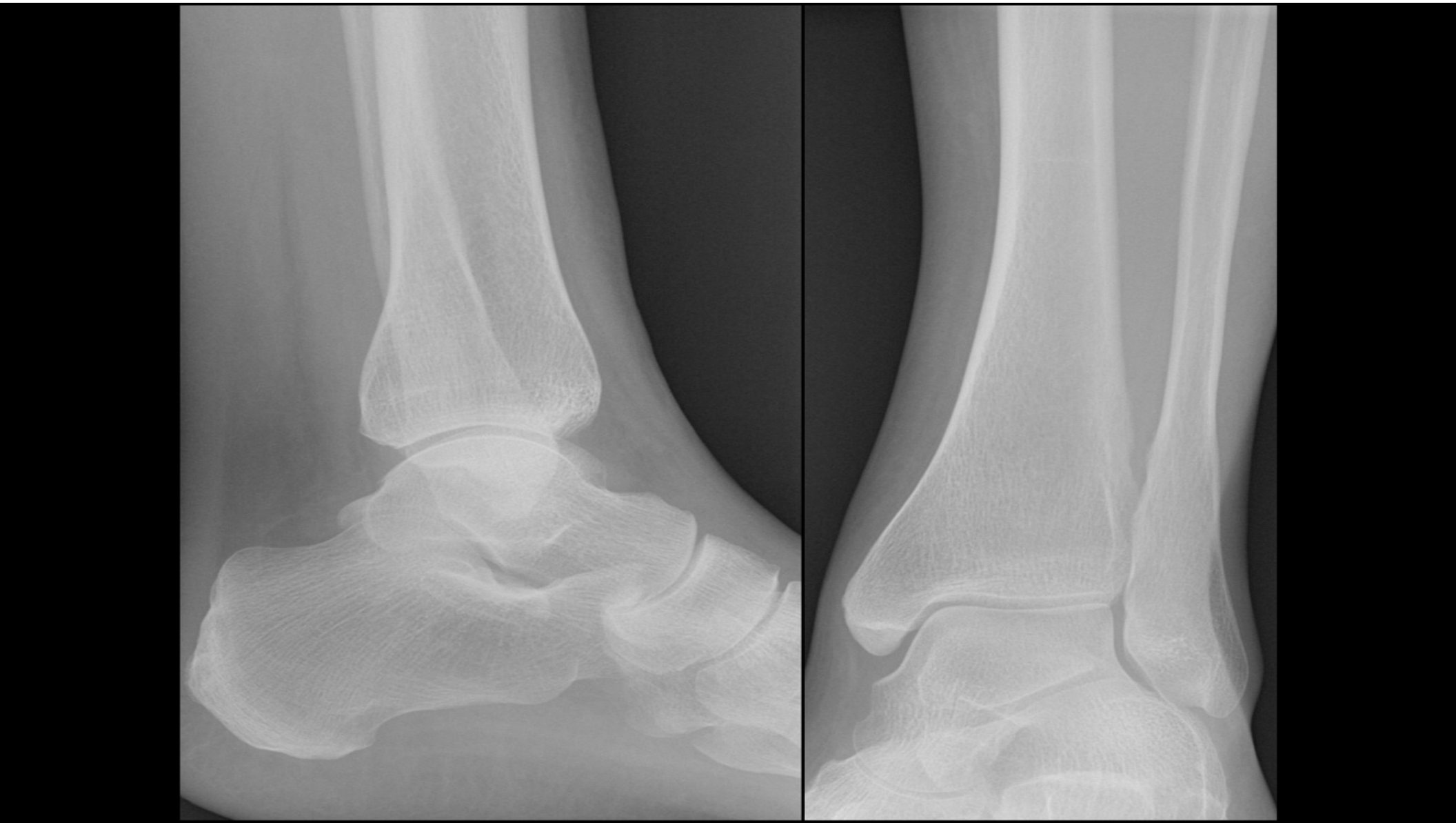
Negative Squeze

+2 Talar tilt

+2 Anterior drawer



EVALUATION?

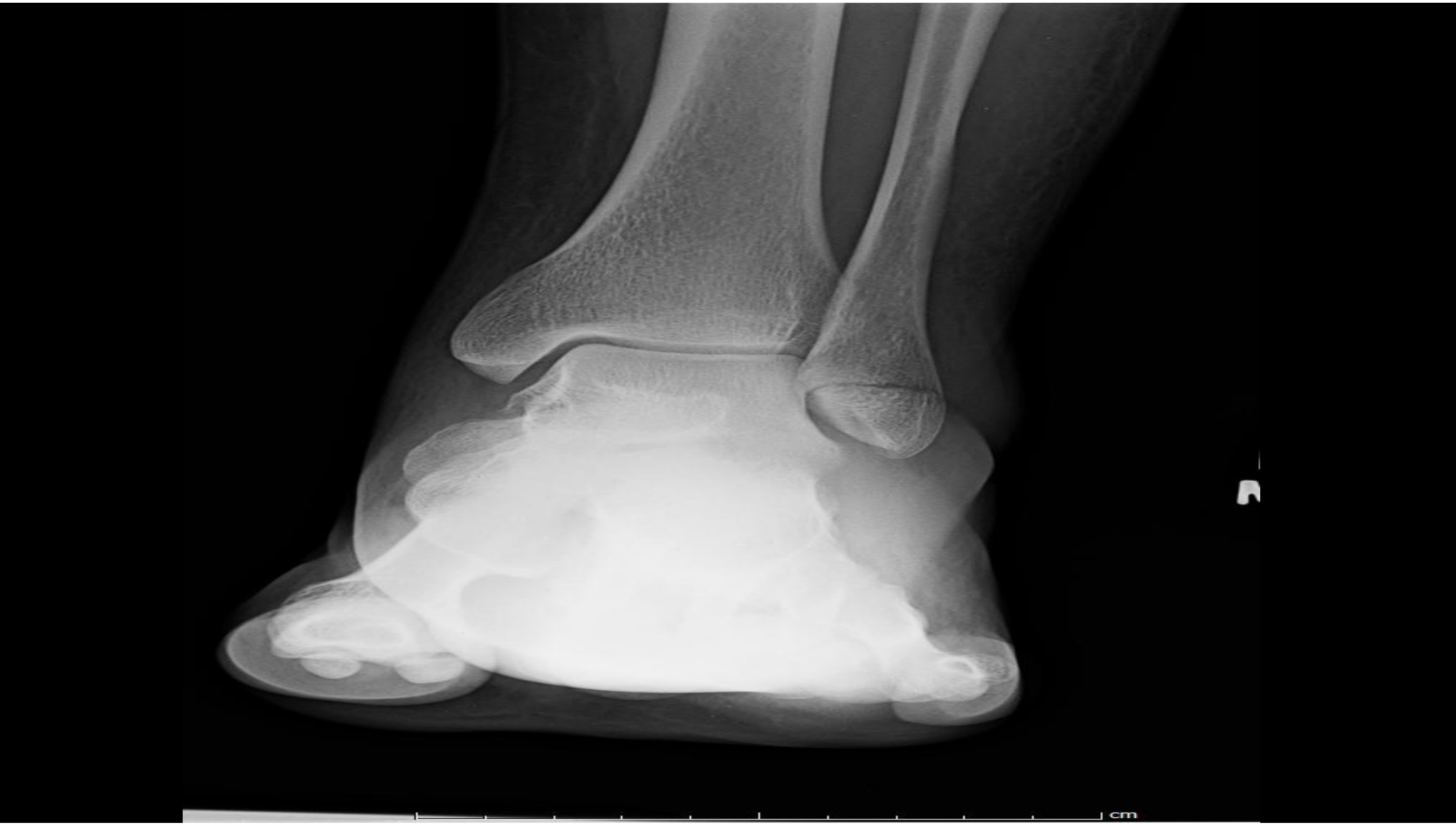


DIAGNOSIS?

Lateral Ankle Sprain

- RICE…Ice, ice, ice, ice, ice
- Start rehab with ATC or PT
- Lace up ankle brace for rest of the season
- Can return to sport when strength is full, able to run/cut without difficulty….ATC/PT will be able to assess….you have to communicate with them

SCENARIO TWO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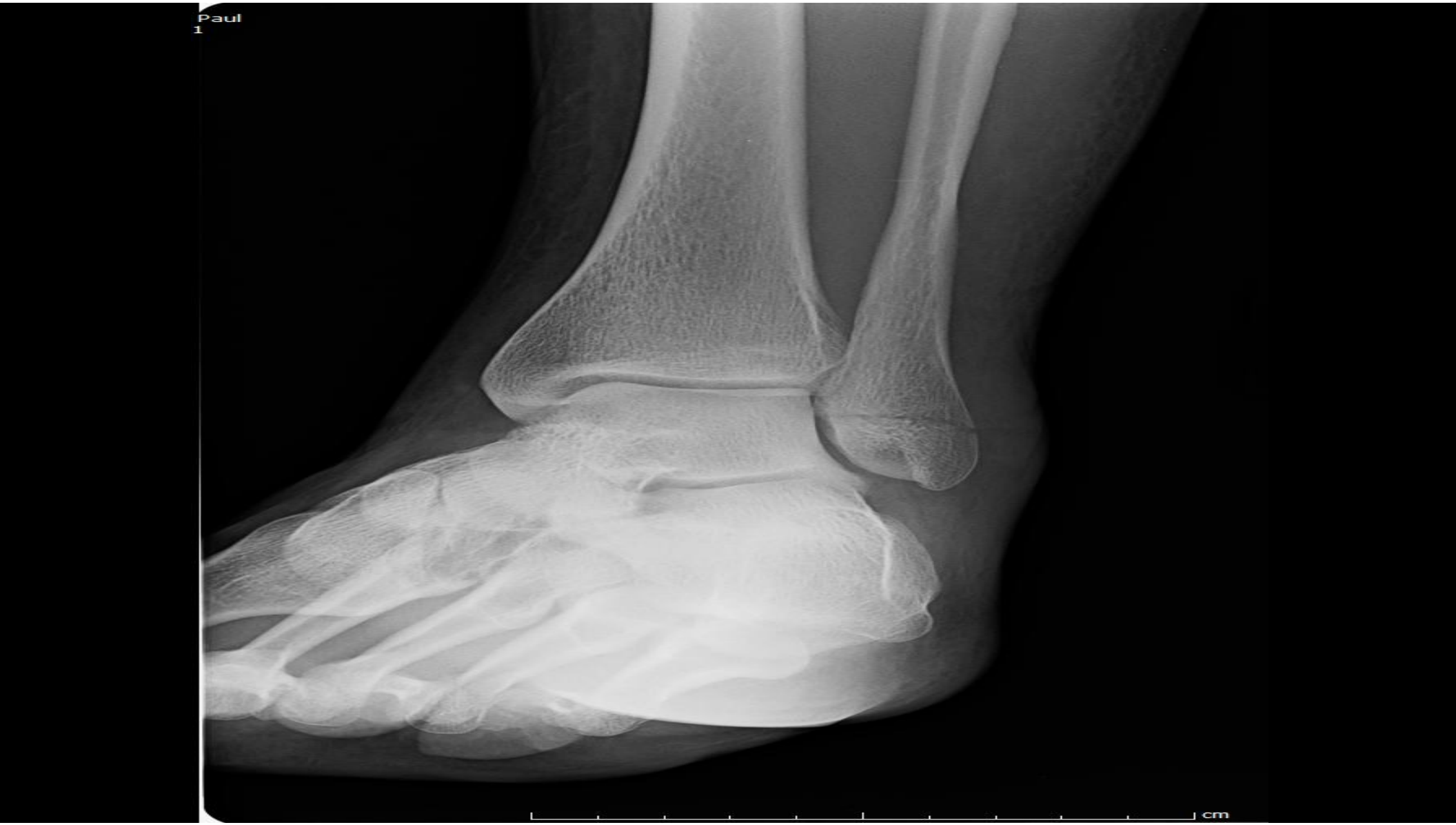
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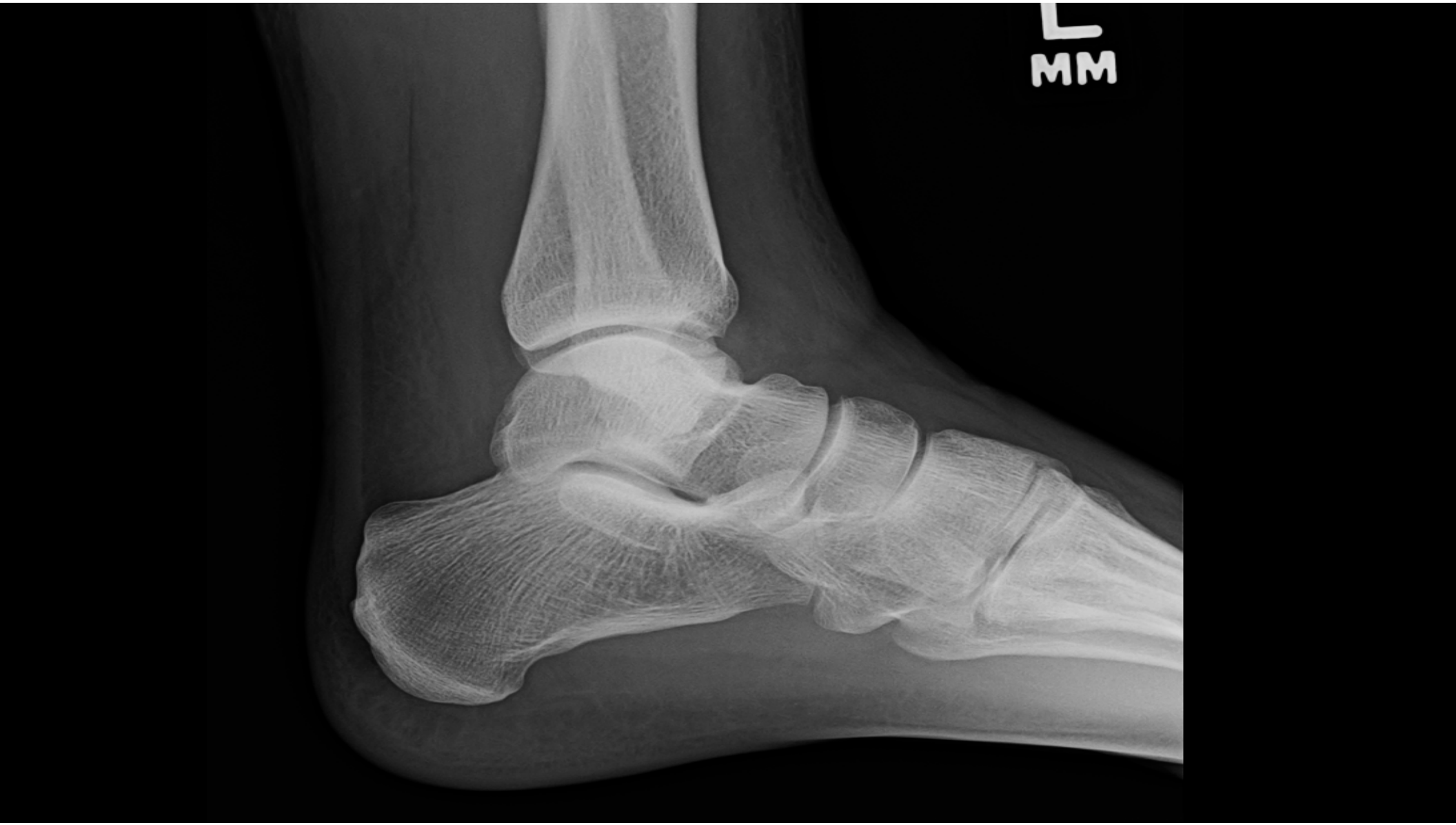
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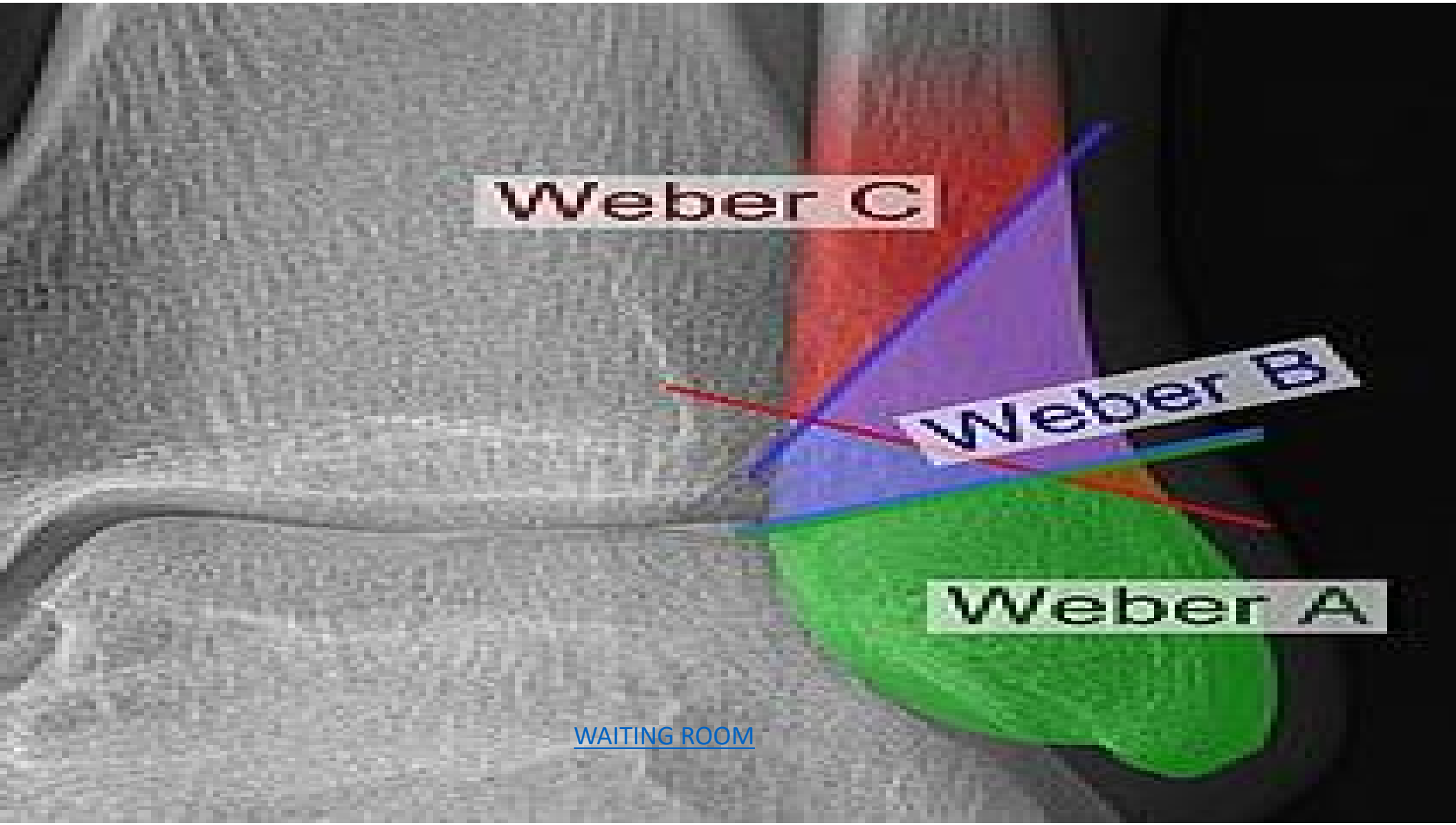
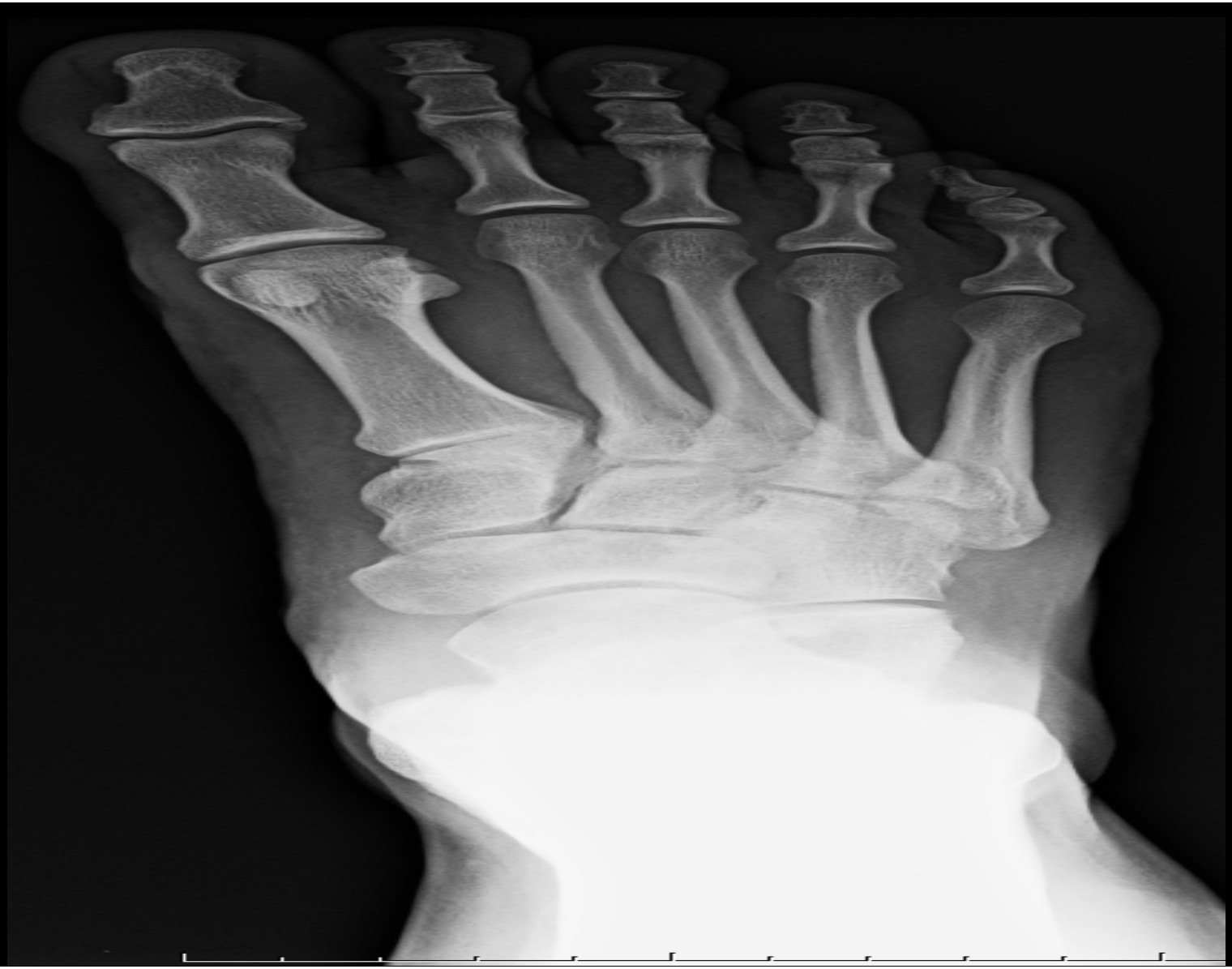


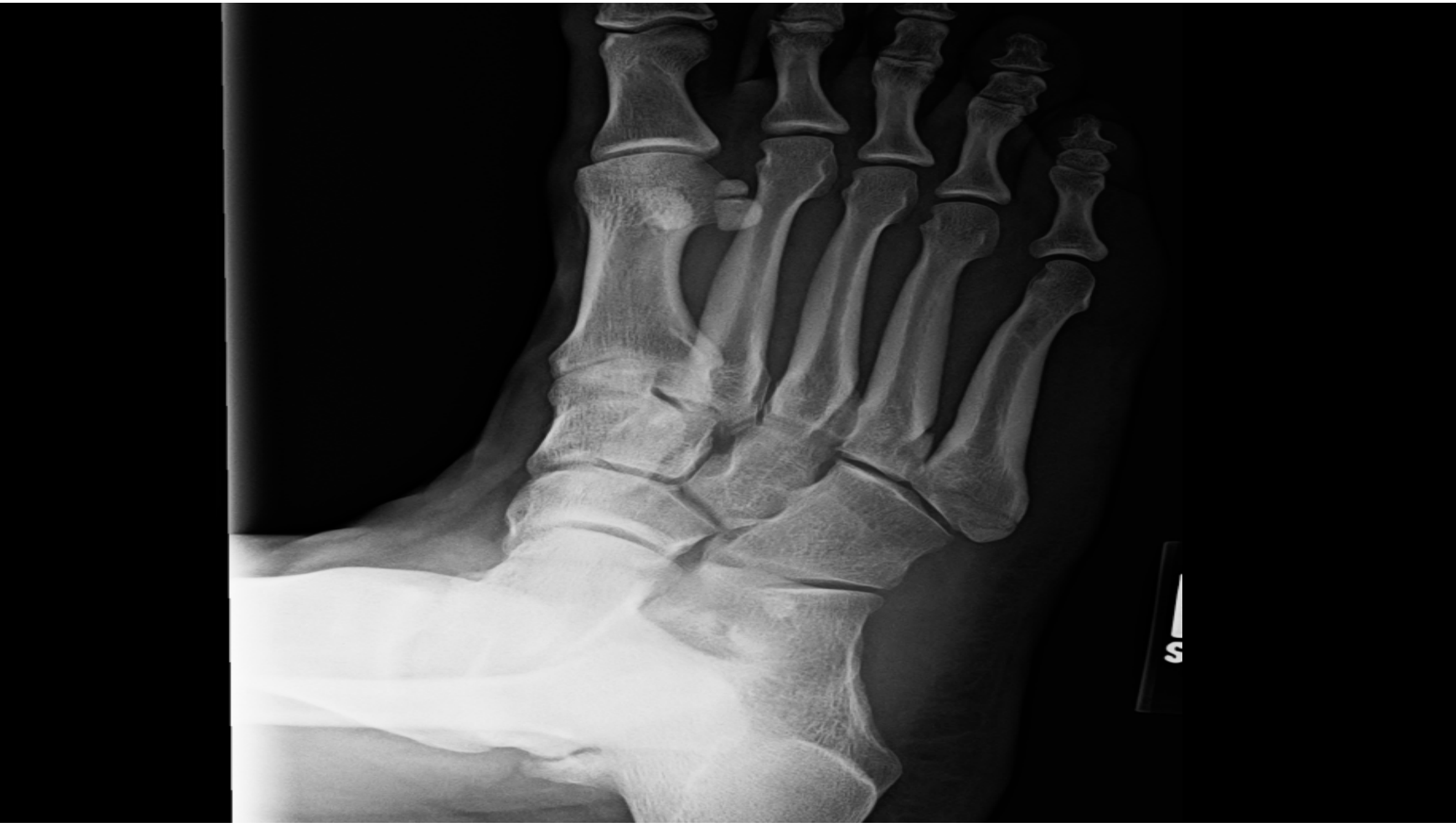
WAITING ROOM

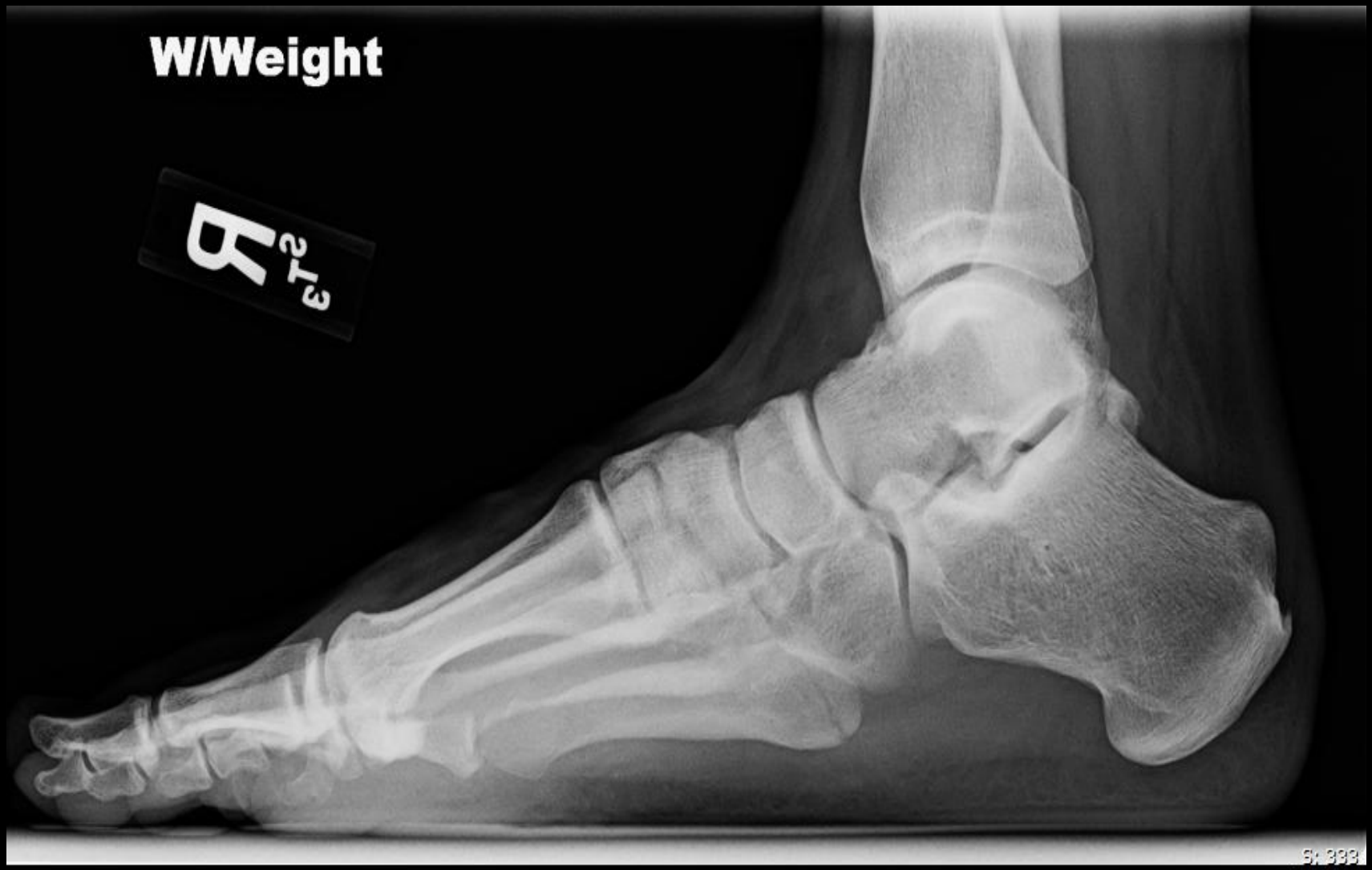
Treatment of Lateral Malleoli Fractures

- Weber A: WBAT 4-6 weeks; early ROM and PT
- Weber B:
  - Is it stable or not?
    - Step 1: Any associated medial injuries: medial malleolar fx, deltoid injury, etc
    - Step 2: Look at Mortise View
    - Step 3: Stress Views
  - Stable: WBAT 6-8 weeks; get into PT early
  - Unstable: Ortho
- Weber C: Ortho Referral

SCENARIO THREE






W/Weight
R

Hudson M, 19 y/o

- Quarterback for Omaha Burke
- Injured left ankle
- Rolled up on while attempting a pass Friday night
- Carted off the field
- ED evaluation negative for fracture; placed in CAM and given crutches.
- Told to f/u with you today

Examination

Left ankle

- Inspection: no gross deformity, ecchymosis throughout the left ankle
- Palpation:
  - Bony: TTP over anterior joint line, no pain over proximal fibula
  - Soft tissue: TTP over AITF and deltoid ligament
- ROM: diffusely reduced
- NVI: DP/PT +2, Sensation intact
- Special tests: Positive Squeeze Test with pain into joint line, Positive ER test

DIAGNOSIS?

Evaluation and Treatment HAS

- Ensure plain films do not show widened mortise
- Make sure no proximal injuries

- Graded 1-3
  - Highly unlikely to have isolated grade 2-3 HAS
  - Does not correlate with MRI findings

- Treatment
  - CAM boot for 2-4 weeks
  - Transition from NWB to PWB to WB as pain allows
  - Aggressive PT
  - Expectation setting
  - Consider surgical referral if legit high level athlete

WAITING ROOM