

Presented by:
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0:00 Introduction

0:28 Stress Fractures

- Definition
- Repetitive microtrauma
- Forces exceed the ultimate stress of bone, cortical and cancellous
- Failure of tensile vs. compression side
- High risk of nonunion tension side
- Fatigue (repetitive approach of stress to normal bone vs. insufficient application of stress to abnormal bone)

1:51 Stress Fractures (cont)

- Foot morphology
- Pes cavus more bone problem
- i.e., stress fractures
- More peroneal tendon problems
- Pes planus
- More posterior tibial tendon problems

2:23 Valgus

3:58 Physical Exam of the Foot and Ankle Video

4:55 Claw Toes Flex:ed PIPJ/DIPJ:
Think Neurologic Involvement

5:56 Freiberg's Infracture

6:27 Stress Fractures (cont 2)

- Specific risk factors
- Sport – repetitive microtrauma
- Hormonal imbalance
- Malalignment
- Foot development – rigid high arch
- Less muscle mass
- Nutritional deficiencies
- Surfaces: hard, uneven
- Training intensity

4:09 Stress Fractures (cont 3)
Risk Factors – Gender Related

- Menstrual disturbances
- Caloric restriction
- Lower bone density
- Muscle weakness
- Leg length differences
- Lower fact diet

7:35 Stress Fractures of the Foot and Ankle

		Rough Incidence	Ranges	
Metatarsals	50%			40-60%
1st	2%			1-3%
2nd	24%			20-30%
3rd	19%			15-25%
4th	1%			1-4%
5th	5%			1-10%
Lateral malleolus				20-30%
Medial malleolus			1-5%	
Os calcis		10%		5-10%
Navicular		3%		1-5%
Sesamoid	5%		1-5%	
Others				1-5%

8:26 High Risk Tensile Side

9:41 Low Risk Compression Side

10:13 Body Locations and Level of Concern

CRITICAL

(at risk, may require surgical intervention)

- Anterior tibial cortex
- Medial malleolus
- Navicular
- Proximal 5th MT diaphysis (Jones Fracture)

10:32 Body Locations and Level of Concern

NON-CRITICAL

(will heal)

- Metatarsals distal 1,2,3,4
- Fibula
- Os calcis
- Talus

10:43 6 weeks & 3 months Pictures

10:27 Fibular Stress Fracture

11:57 Initial

12:20 Femoral neck stress fracture
Compression side treated nonoperatively.

Healed 60 mo. later.

12:48 Patella Stress Fracture Pictures

13:26 18 YO Freshman Div. I basketball athlete

- C/O mid-foot pain, L greater than R
- Started when she was running, playing in shoes mandated by her school
- History of "normal" periods

14:04 Navicular view

30° ER

Torg described

15:47 Stress Fractures

5th metatarsal base fractures

TYPE	DESCRIPTION
I.	Acute Nondisplaced Displaced
II.	Previous injury abnormal Previous radiographs
III.	Styloid Process No 5th MT – cuboid involvement 5th MT – cuboid involvement

16:10 9 YO very active boy

- Does all sports
- Casted for 5th metatarsal fracture
- Broke cast
- Seen for continued pain

16:34 Left foot, 5th Metatarsal Fx

17:05 College freshman football athlete.

- Refracture of nonunion, Right foot, 5th metatarsal.
- initial xrays.

17:22 2.5 months post op

17:38 2 years post op.

17:51 Right Ankle

- Ectopic bone in the plantar fascia. Plantar fascia ossification.
- Surgery:
- Excision of mass in right calcaneus

18:59 15 YO Football Athlete

- Running on Hard Ground
- C/O heel pain walking or running

19:10 Calcaneal Stress Fractures

19:45 Stress Fractures

CALCANEAL APOPHYSITIS

(Sever's Disease)

- Repetitive microtrauma
- Normal Radiographs
- Sclerosis due to normal

multicenter ossification

21:24 Accessory Ossicles

- Specific names
- Os peroneum
- In tendon at cuboid level
- Os versalianum
- Present in 15%
- Insertion peroneus brevis
- Usually bilateral
- Present in 0.1%

22:22 19 YO basketball player Os vesalianum bilateral feet.

23:28 Os peroneum

23:46 9 YO Female Cheerleader

- Right ankle pain
- Fell from a stunt and has pain and localized bump, medial ankle
- Stress reaction, medial malleolar accessory ossification center

24:39 Medial Malleolus

Left ankle:

18 yo went up for jump shot & felt pop & sudden onset of pain over medial aspect of ankle

25:03 ~ 2 weeks post ORIF & ~ 2 months post ORIF

25:24 Radiographs in ER post injury

25:59 Post injury – Salter IV distal tibia nonunion (2 and 4 months)

26:18 Surgery – 9 months post injury

26:53 17 YO Male

- Left ankle pain x3 weeks
- Trying to get in shape, played more basketball than usual

- Possible stress fracture of the medial malleolus

27:29 3 months after initial presentation

27:41 5 Months after initial presentation

28:00 7 months after initial presentation

28:22 Small Blue Cell Tumor

Ewing's sarcoma

vs.

Lymphoma

29:18 CONCLUSIONS

- Know differences of ossicles vs. stress fractures based on physical exam and radiographic appearance

30:05 The End . . .Thank You!