

# Tibial Tuberosity Fracture in Adolescent Male

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# Disclaimer

We have no relevant disclosures.

# Objectives

- Understanding and recognizing the presentation of tibial tubercle fractures
- Understanding the complications involved in this injury
- Understanding the management strategies involving this injury

# Case History

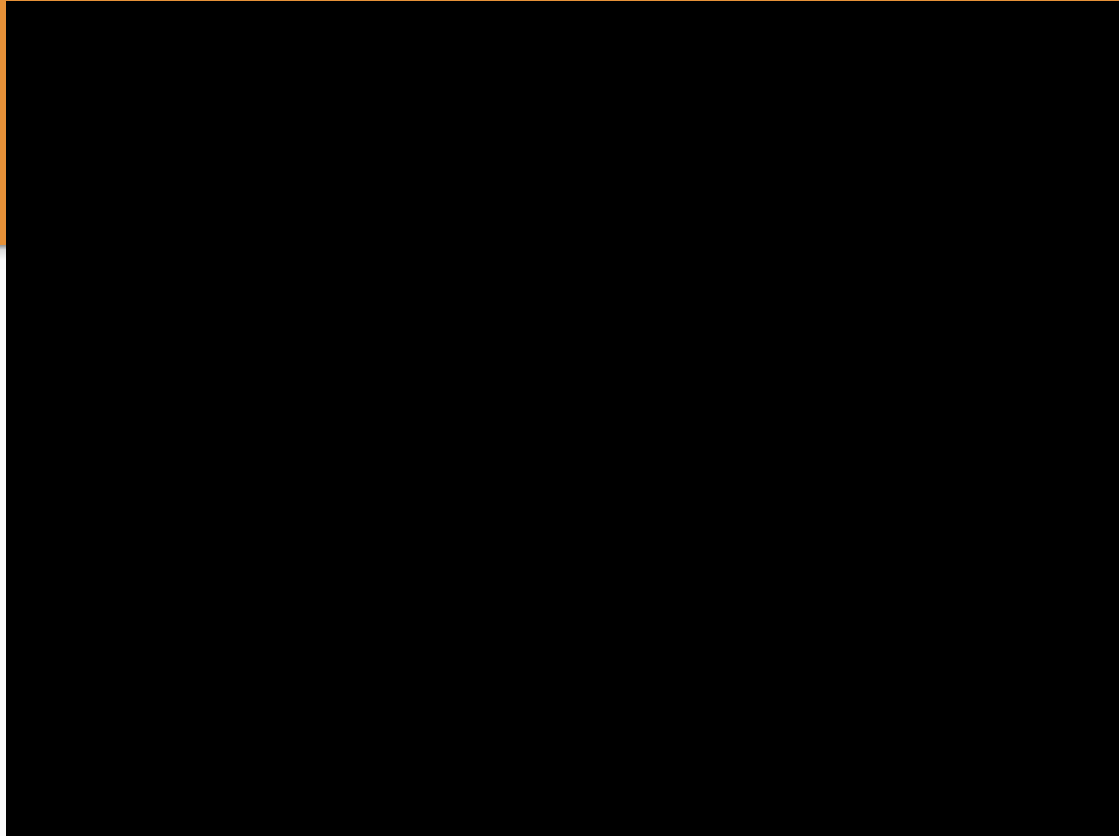
- 14-year-old male injured left knee while jumping off his left leg when attempting a lay-up.
- He was initially seen in the ER where he presented with obvious swelling of his left knee. Physical exam was significant for obvious effusion and severe tenderness to palpation. There was a loss of active extension and no other special tests were performed due to pain.
- Initial X-rays were performed. Patient was placed in a knee immobilizer and referred to orthopedics for follow up.



# Initial X-Rays



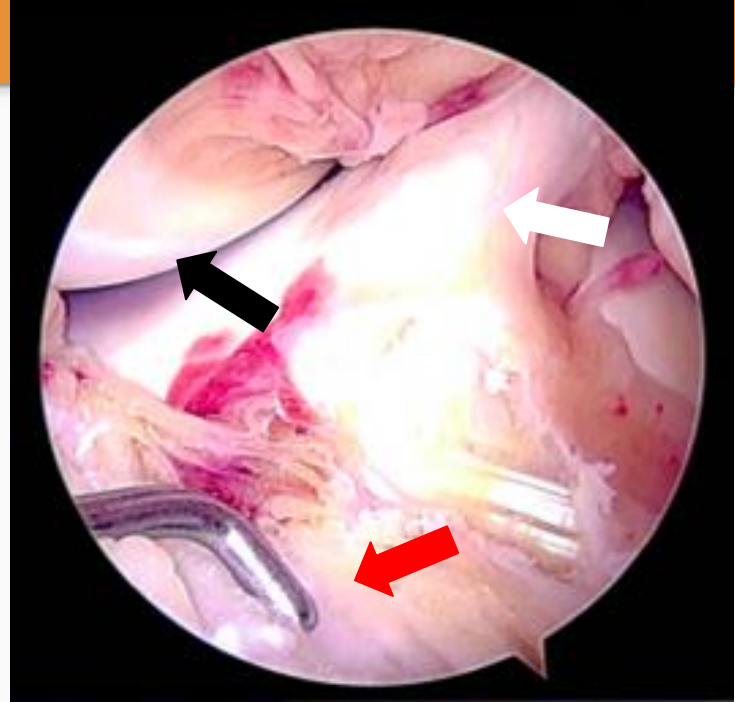
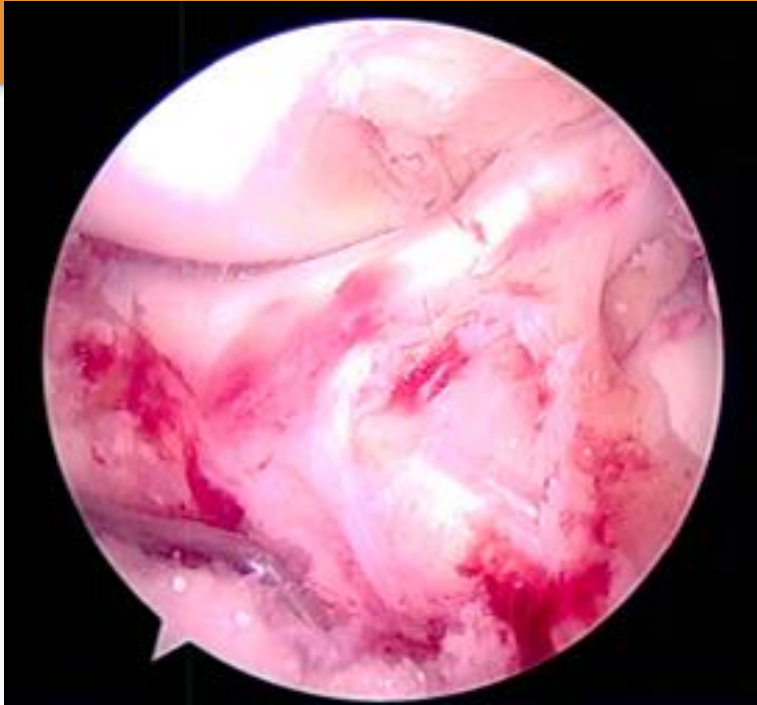
# MRI



# Surgery

- An arthroscopic-assisted open reduction with internal fixation was performed.
- During arthroscopy it was found that cartilage and ligamentous structures were intact throughout the knee.
- 4 screws were used to reduce the tibial fracture back into anatomical alignment.
- Anterior fascial release was also performed to prevent possible compartment syndrome complication.

# Arthroscopy Images





# Post-Operative X-Rays



# Post-Op Recovery

- Patient was placed in a TROM brace locked in full extension directly after surgery. He was given partial weight bearing restriction with crutches for the first 3 weeks.
- At the 3 week mark, he started progressive ROM and strength training with physical therapy.
- He was allowed to progress to 90 degrees of flexion by week 6, and full ROM at 2 months.
- At 12 weeks post-op, he was allowed to progress to full weight-bearing and participate in warm-up, non-contact activities.
- He is currently scheduled to follow-up in 2 weeks for final clearance for full participation.

# Tibial Tuberosity Fractures

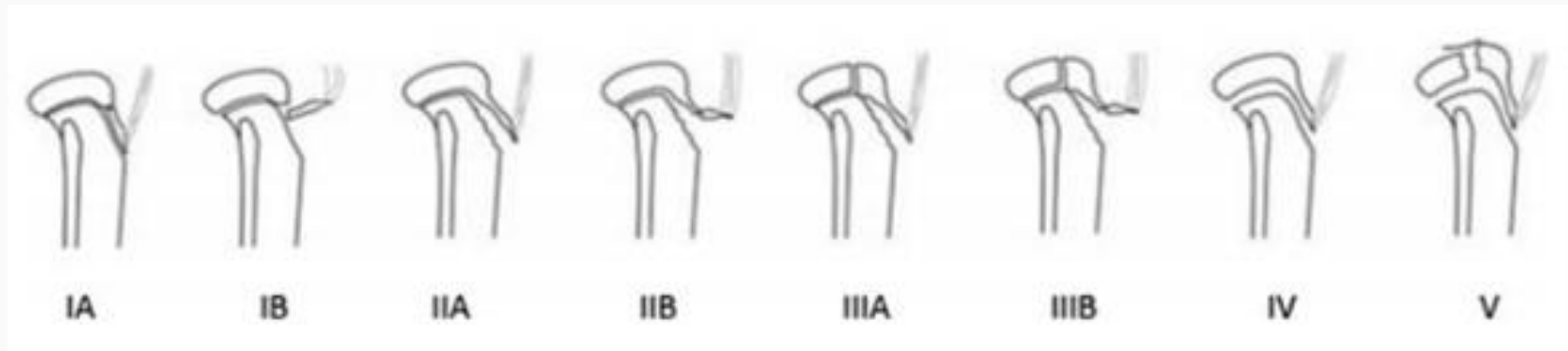
## Incidence

- 0.4% - 2.7%
- Increasing incidence
- Usually in adolescents between the ages of 12-16
- More commonly seen in males than females
- Left knee > right knee

# Tibial Tuberosity Fractures

## Classification

- Ogden Types I-V with A & B sub-modifiers



Formiconi F, D'Amato RD, Voto A, Panuccio E, Memeo A. Outcomes of surgical treatment of the tibial tuberosity fractures in skeletally immature patients: an update. *European journal of orthopaedic surgery & traumatology*. 2020;30(5):789-798.

# Tibial Tuberosity Fractures

## Risks

- Concomitant injuries such as ligamentous or cartilaginous injury
- Compartment Syndrome due to injury to the recurrent branch of the anterior tibial artery
- Abnormal physeal growth

## Differential Diagnoses

- Osgood-Schlatter disease
- Sinding-Larsen-Johansson Syndrome
- Patellar fracture
- Patellar tendon injury

# Tibial Tuberosity Fractures

## Treatment

- Nonoperative
  - Immobilization
- Operative
  - Open reduction internal fixation (ORIF)
  - Arthroscopy

## Outcomes

- Average recovery time is 29 weeks
- Most common complication is anterior knee pain and/or bursitis due to implant irritation
- Other complications include refracture or genu recurvatum

# References

Formiconi F, D'Amato RD, Voto A, Panuccio E, Memeo A. Outcomes of surgical treatment of the tibial tuberosity fractures in skeletally immature patients: an update. *European journal of orthopaedic surgery & traumatology*. 2020;30(5):789-798. doi:10.1007/s00590-020-02629-y

Frey S, Hosalkar H, Cameron DB, Heath A, David Horn B, Ganley TJ. Tibial tuberosity fractures in adolescents. *Journal of children's orthopaedics*. 2008;2(6):469-474. doi:10.1007/s11832-008-0131-z

Pretell-Mazzini J, Kelly DM, Sawyer JR, et al. Outcomes and Complications of Tibial Tubercle Fractures in Pediatric Patients: A Systematic Review of the Literature. *Journal of pediatric orthopaedics*. 2016;36(5):440-446. doi:10.1097/BPO.0000000000000488

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# Thank You!

Thank you to the patient and his family for generously allowing us to present this case!



# Questions?

Please do not hesitate to contact us at any of our emails below if you have any further questions!

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